CHAPTER 11

ORGANIC COMMUNICATIONS EQUIPMENT

Communication is the voice of command. Without the equipment to provide rapid, reliable, secure, and efficient tactical communications, a commander in the field cannot effectively exercise command and control of his forces, call in available fire support, or maintain adequate channels of logistics. In battle, poor communications cost lives. On a construction project, inefficient communications cost time, money, and material; however, even the most advanced and sophisticated communication system is of little consequence in the hands of untrained personnel. Either by design or through necessity, any one of us, as Seabees, could be called upon to use the battalion's tactical communications equipment in an emergency; therefore, familiarize yourself with the communications systems in this chapter. Know what each system does, how it works, and when and whereto use it. The intent of this chapter is to do just that. Do not be a liability to your shipmates. A well-rounded understanding of communications by all hands greatly upgrades the overall operational efficiency of the battalion.

MEANS OF COMMUNICATION

The most common means of communication is simply speaking to one another–voice communication. When you need to communicate over longer distances, your voice is transmitted and received by electrical means, such as radio or telephone. Other means of communicating by sound are by whistles, sirens, horns, gunfire, and so forth. Messages may also be communicated through visual means (hand signals, smoke, and flags) and in writing (orders, messages, and reports). Each of these means of communication are discussed in this chapter.

Effective communication is essential for control of the company and its elements. The company uses a combination of radio, wire, messenger, visual, and sound communications to provide as many ways to transmit messages as conditions permit. Radio is the primary means of communication in all tactical, on-the-move operations. Communications (COMM) wire is the primary system used during a static defense.

Each commander is responsible for the installation, operation, and maintenance of his unit's communication system and for its efficient operation as a part of the next higher unit's system. Each commander exercises tactical and technical supervision over the communication system of all the units of the command.

RESPONSIBILITIES

Every Seabee is responsible for good communications. The importance of passing the word cannot be overemphasized. Knowing what is happening and what is expected aids us in achieving a successful mission. You must develop good, two-way communications both up and down the chain of command if you are to stay alive in combat. The responsibility for communication among units is subject to the following general rules:

- The higher unit is responsible for establishing communication with the next lower unit and attached units.
- A unit supporting another unit establishes two-way communication with that unit.
- Lateral communication between adjacent units is established and maintained by the unit on the left to the unit on the right, unless directed otherwise by higher authority.
- Although one unit is specifically charged with establishing and maintaining communications with another unit, only through the mutual efforts of all the members of each unit can continual communications be maintained.
- The company commander is responsible for the installation, operation, and maintenance of the company communications system and for its efficient operation as part of the battalion system. Instructions about all communications are found in the operation orders.

COMMUNICATIONS

Radio and messengers are the primary means of communication for offensive combat and for other operations involving rapid or extensive movement. These methods may be supplemented by visual and

sound signals. As a Seabee, you normally use the radio as the main source of communication while on a convoy because most of your vehicles have radios mounted in them.

Normally, wire and messengers are the primary means of communication in defense. Radio is used when wire service is interrupted after the enemy has made contact or when ordered by a higher command. Two or more wire lines should be installed over different routes to connect two units. This allows communication to be quickly reestablished if one line goes out. Visual and sound signals may be used to supplement wire in the defense, but only when they do not compromise security.

Visual signals include panel sets, pyrotechnics, smoke of various types and colors, arm and hand signals, flashlight, tracer ammunition, improvised lights, and flags. Higher headquarters normally prescribes the use of pyrotechnics or smoke signals to call for shift, lift, fire, or illumination.

Sound signals are normally used for alarms to warn of air, chemical, biological and radiological (CBR), or ground attack Whistles, horns, bells, small arms, or other noisemakers may be used for sound signals.

No matter what type of communication is used, assume that you are being monitored by the enemy. This is particularly true of radio, which is the **LEAST secure** means of communication.

UNDERSTANDING RADIO AND TELEPHONE NOMENCLATURE

The radios, telephone, and the switchboard discussed in this section are those presently on the NMCB Table of Allowance (TOA). To help you understand the component nomenclature and their family names, the following examples are provided:

- AN/PRC-77 and AN/PRC-104 radios
  1. The AN indicates the users (Army/Navy).
  2. The P indicates the type of installation (pack, portable).
  3. The R indicates the type of equipment (radio).
  4. The C indicates the purpose (communications).
  5. The numbers 77 and 104 indicate the model numbers.

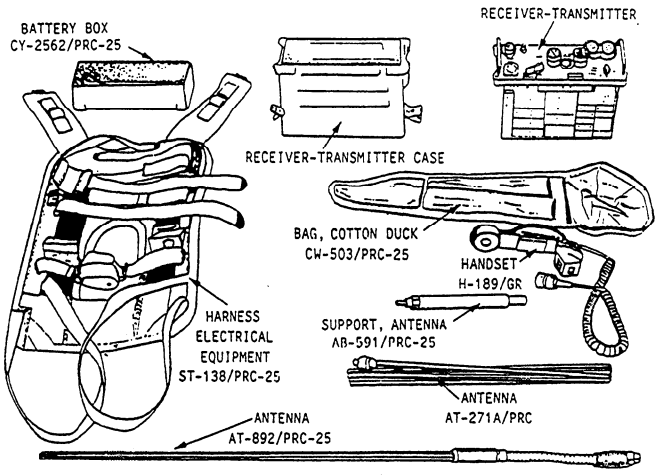
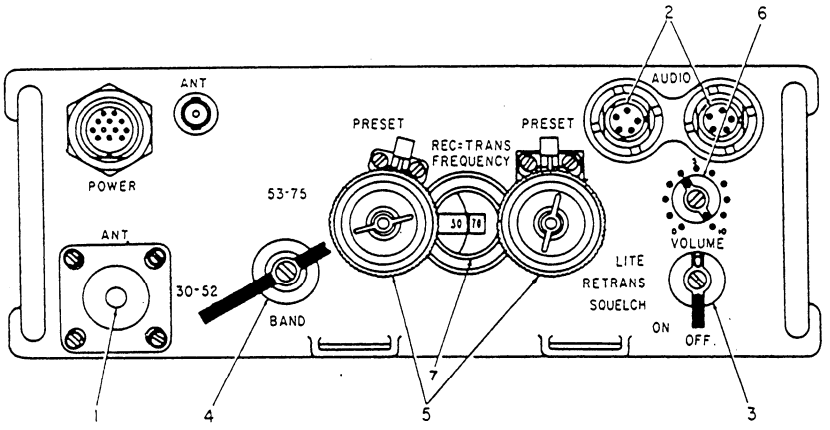


Figure 11-1.—Radio Set AN/PRC-77 components.

- TA-312/PT and TA-1/PT telephones
  1. The TA indicates the type of equipment (telephone apparatus).
  2. The numbers 312 and 1 indicate the model numbers.
  3. The P indicates the installation (pack, portable).
  4. The T indicates the type and purpose of the equipment (telephone [wire] transmitting).
- SB-22/PT switchboard
  1. The SB indicates the type of equipment (switchboard).
  2. The number 22 indicates the model number.
  3. The P indicates the installation (pack, portable).
  4. The T indicates the purpose of the equipment (telephone [wire] transmitting).

AN/PRC-77 Radio

The AN/PRC-77 radio set shown in figure 11-1 is a short-range, man-packed, portable, frequency-modulated (FM) receiver-transmitter used to provide two-way voice communication. The AN/PRC-77 operates on low power and at very high frequencies (vhf). The location of the equipment greatly affects its operating range. Normally, a line-of-sight range can be expected; that is, when the other station can be seen,



TO OPERATE SET

A. THE NUMBERS OF STEPS 1 THROUGH 6 BELOW RELATE TO THE NUMBERS ON THE DIAGRAM.

(1) INSTALL THE ANTENNA REQUIRED FOR THE TYPE OF OPERATION IN THE ANT MOUNT.

(2) ATTACH HANDSET H-189/GR TO EITHER AUDIO CONNECTOR.

(3) TURN THE FUNCTION SWITCH TO ON.

(4) TURN THE BAND SWITCH TO THE DESIRED OPERATING FREQUENCY BAND.

(5) TURN THE MHz TUNING AND KHz TUNING CONTROL KNOBS UNTIL THE DESIRED FREQUENCY APPEARS IN THE CHANNEL DIAL (7).

(6) TURN THE VOLUME CONTROL TO 4.

(7) PRESS THE HANDSET H-189/GR PUSH-TO-TALK SWITCH AND SPEAK INTO HANDSET. RELEASE THE PUSH-TO-TALK SWITCH TO LISTEN.

(8) ADJUST THE VOLUME CONTROL (6) FOR A DESIRABLE SOUND LEVEL.

(9) TO REDUCE THE RUSHING NOISE WHEN NO SIGNAL IS BEING RECEIVED, TURN SWITCH (3) TO SQUELCH.

TO TURN SET OFF

B. TURN THE FUNCTION SWITCH (3) TO OFF.

Figure 11-2.—Operating instructions for Radio Set AN/PRC-77.

satisfactory operation improbable. An intervening hill or a tall building may hamper or prevent contact with other stations.

Valleys, densely wooded areas, and low places are poor sites for setting up communications. A hilltop or a tower location increases the operating distance. When possible, avoid locations near a source of electrical interference, such as power or telephone lines, radar sets, and field hospitals.

The AN/PRC-77 consists of a receiver-transmitter (Radio RT-841/PRC-77) and minor components. The receiver-transmitter is held in the receiver-transmitter case by four screws. The battery box is attached to the receiver-transmitter case by two clamps . The complete unit, when assembled, is watertight. All controls are located on the front panel. A battery plug projects from the receiver-transmitter and mates with the connector of the battery. The power for this set is provided by a BA-4386 magnesium-alloy battery that enables the radio to operate for about 30hours before a replacement battery is needed.

Minor components include a cotton duck harness (ST-138/PRC-25) so the radio can be strapped to the operator's back; a short antema (AT-892/RC-25) for general, short-range service; a six-section, long antenna (AT-271A/RC) for maximum range; and antenna support (AB-591/PRC-25) for use with the long antenna; a handset (H-189/GR) that consists of a microphone and receiver for transmitting and receiving signals; and a cotton duck bag (CW-503/PRC-25) that is divided into several pockets used to store the two antennas, the antenna support, and the handset. Operating instructions for the AN/PRC-77 are shown in figure 11-2.

AN/GRC-160Radio

The Radio Set AN/GRC-160 is designed for use in vehicles, and it uses the same radio (RT-841) as the AN/PRC-77. An AM-2060 amplifier provides operating voltage to the RT-841/PRC-77 and, also, has a self-contained loud speaker that amplifies the signal received. The installation kits are provided for specific vehicles and are permanently installed in the vehicles.

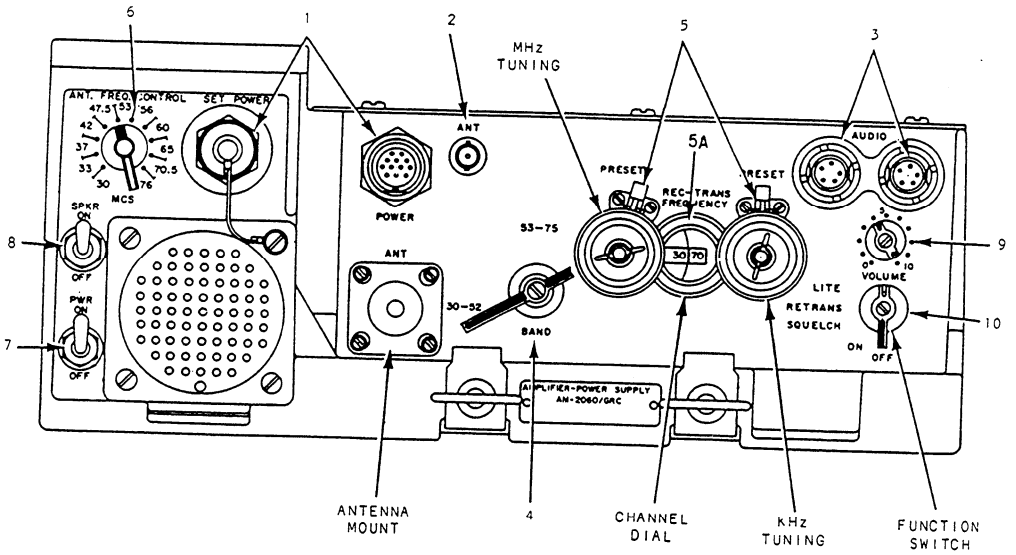


Figure 11-3.—Amplifier-Power Supply AM-2060/GRC and Receiver-Transmitter, Radio RT-505/PRC-27, 77.

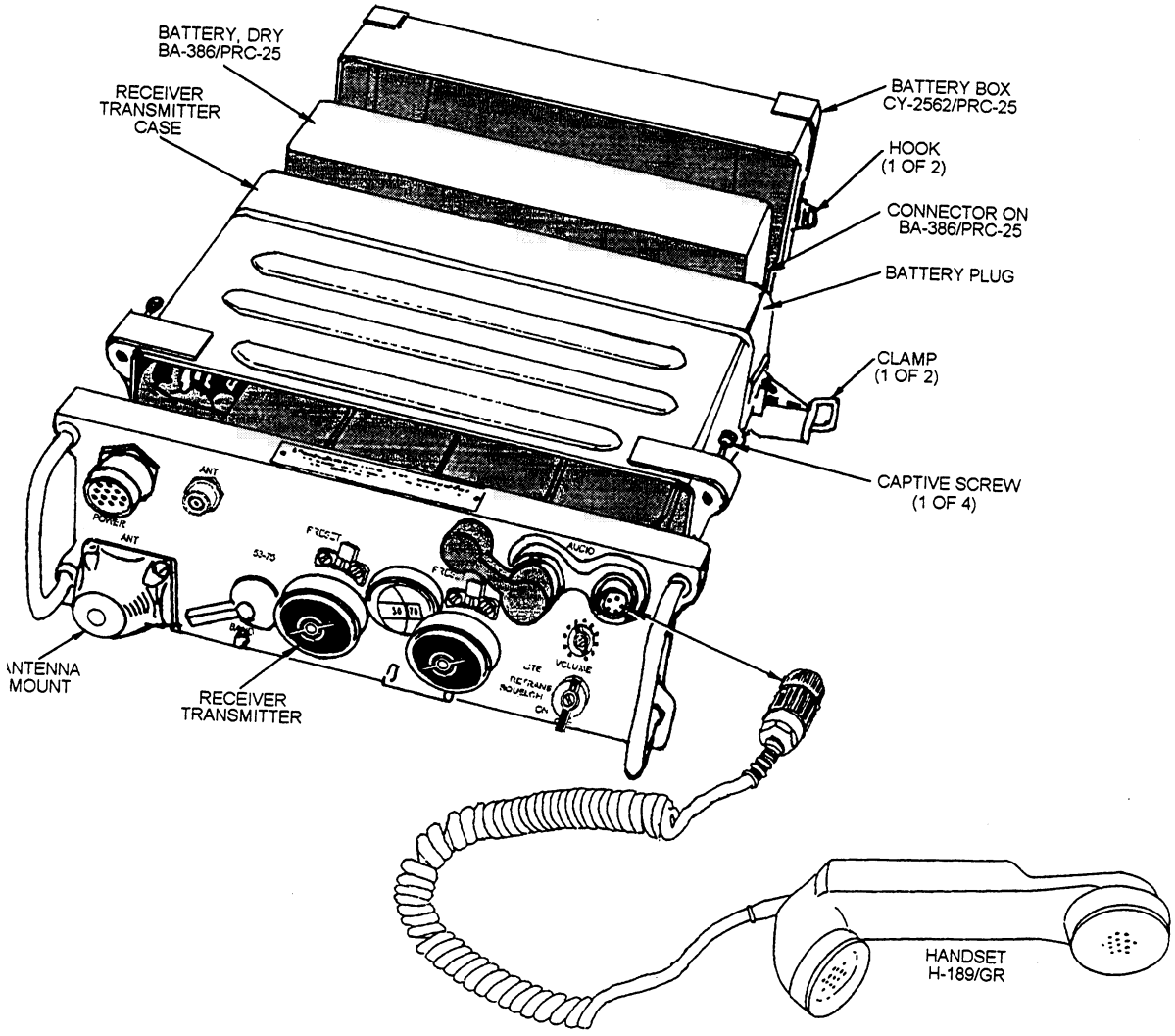


Figure 11-4A.—Receiver-Transmitter 841 for Radio Set AN/GRC-160.

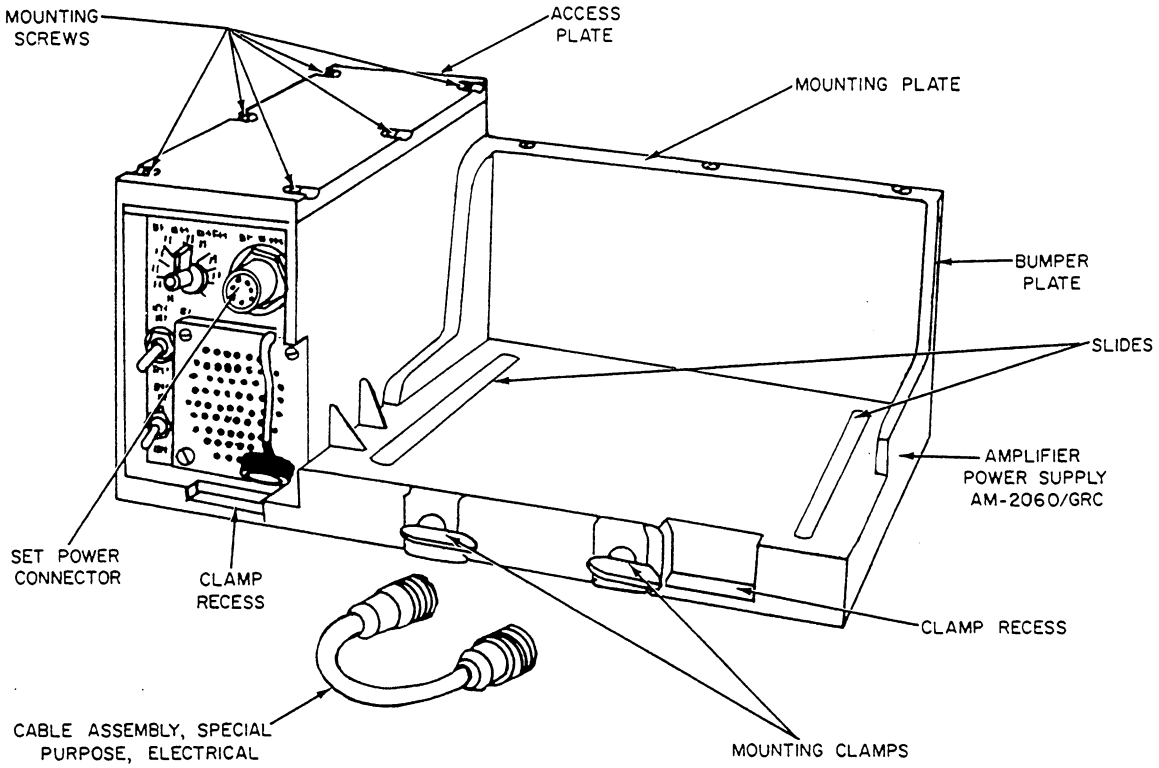


Figure 11-4B.—Amplifier AM-7060 for Radio Set AN/GRC-160.

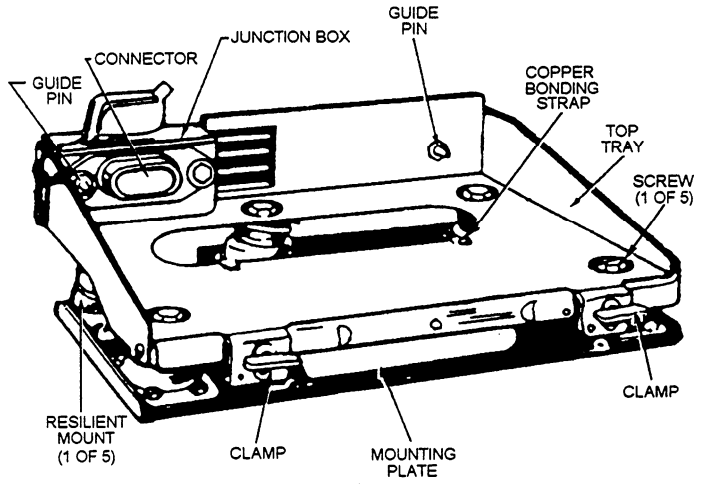


Figure 11l-4C.—Mounting MT-1029/URC for Radio Set AN/GRC-160.

To operate the radio, follow these steps. (The numbers of Steps 1 through 10 below are keyed to the numbers on the diagram shown in figure 11-3.)

1 Attach Cable CX-4665/GRC between the power connectors (SET POWER).

2 Attach the antenna cable to the antenna connector (ANT).

3 Attach Handset H-189/GR (fig, 11-1) to either audio connector (AUDIO).

4. Turn the band switch to the desired operating frequency band.

5. Turn the MHz tuning and the kHz tuning control knobs until the desired frequency appears in the channel dial. (5A: REC-TRANS FREQUENCY).

6. Set the antenna frequency control to match the frequency appearing in the charnel dial (5A).

7. Turn the power switch to PWR ON.

8. Turn the speaker switch to SPKR ON.

9. Turn the volume control to 4.

10. Turn the function switch to ON.

11. Press Handset H-189/GR (fig. 11-1) PUSH-TO-TALK switch (on the right side of the handset) and speak into the handset. Release the PUSH-TO-TALK switch to LISTEN.

12. Adjust the VOLUME control (1 O) for a desirable sound level.

13. To reduce the rushing noise when no signal is being received, turn switch (10) to SQUELCH.

Figures 11-4A, 11-4B, 11-4C, and 11-4D present the components of the AN/GRC-160.

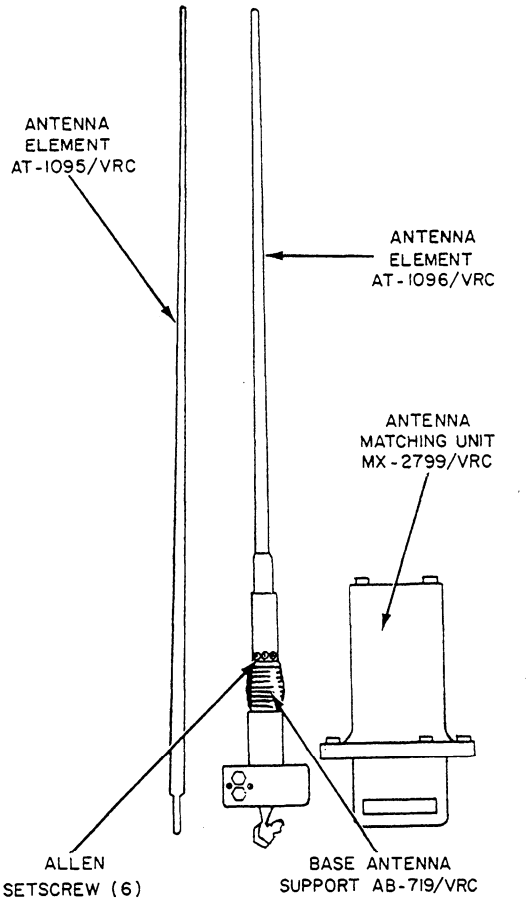


Figure 11-4D.—Antenna AT-912/URC for Radio Set AN/GRC-160.

AN/PRC-104 Radio Transceiver

The AN/PRC-104 (fig. 11-5A, 11-5B, and 11-5C) is a state-of-the-art lightweight radio transceiver (transmitter and receiver combined) that operates in the high frequency (hf) and upper part of the low frequency (lf) portions of the radio spectrum. The receiver/transmitter circuits can be tuned to any frequency between 2.0000 and 29.9999 MHz in 100 Hz increments, making it possible to tune up to 280,000 separate frequencies. The radio set operates in the upper sideband (USB) or lower sideband (LSB) modes for voice communications, CW for morse code, or frequency shift keying (FSK) for transmission of teletype signals or other data. In the man-pack configuration the radio set is designed to be carried and operated by one manor, with the proper accessories, the radio set can be configured for vehicular or fixed-station use.

The control panel (fig. 11-6) was engineered for ease of operation by making it possible for the operator to adjust the front panel controls–even while wearing heavy gloves. Unlike older, similar radio sets, there are no front-panel meters or indicator lights on the AN/PRC-104. The functions that formerly required these types of indicators (antenna tuning, battery condition, etc.) are monitored by the radio itself and communicated to the operator as special tones in the handset. This feature is particularly useful during tactical black-out operations. The superior design and innovative features of the AN/PRC-104 radio set now make it possible to maintain a reliable long-range communications link using lightweight, portable equipment that can be operated by personnel with a minimum amount of training.

RADIO SET.— The AN/PRC-104 radio set consists of three units: (fig. 11-7) low-power receiver-transmitter RT-1209/URC (receiver/exciter), 20-watt radio frequency amplifier AM-6874/PRC-104 (amplifier/coupler), and battery case CY-7541/PRC-104 (battery pack). Quick-disconnect latches secure the receiver/exciter to the amplifier/coupler, and each is latched to one end of the battery pack When latched together, the receiver/exciter is electrically interconnected with the amplifier/coupler through a built-in connector; the battery pack power is connected to the amplifier/coupler. All of the operator controls and connections are located on the receiver/exciter front panel, except for the antenna select switch and antenna connections located on the amplifier/coupler unit. They are constructed on a die-cast aluminum housing; the battery pack housing is tough plastic. Watertight seals for the covers and panels make the three units watertight, submersible, and capable of rough handling and abuse in any field environment. The unit circuits are modular for ease of repair. The total weight of the assembled AN/PRC-104 (three units with battery) is 14 pounds, making it a lightweight and easily carried package.

MAN-PACK OPERATION.— The basic man-pack configuration (fig. 11-8) consists of the radio set (three units), a whip antenna, and an audio input/output device. Antenna AT-217A/PRC is a 10-foot standard whip antenna that screws into the Spring Section Antenna AB-129/PR (shock mount) which, in turn, screws into the antenna mount on the amplifier/coupler. The whip antenna is adequate for most short-range requirements (less then 10 miles). Two standard input/output devices come with the radio set: Handset H-189/GR and Telegraph Key KY-872/PRC-104. These are attached to either of the two AUDIO connectors on the receiver/exciter. The radio transmitter (exciter) is enabled (keyed) by the handset push-to-talk (PTT) button or by depressing the telegraph key to contact. The receiver is operative only when the transmitter is disabled;

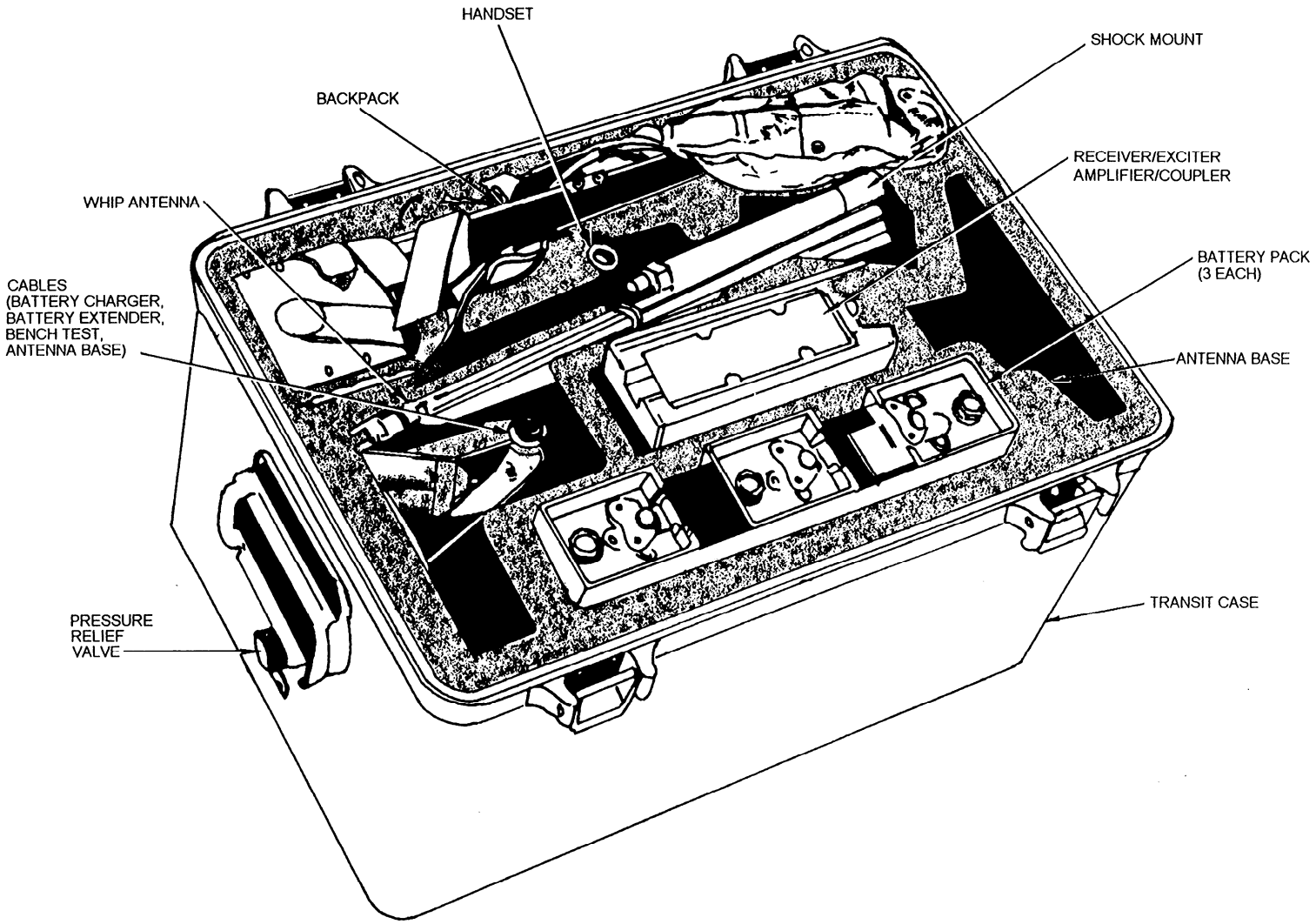


Figure 11-5A.—Radio Set AN/PRC-104 equipment supplied.

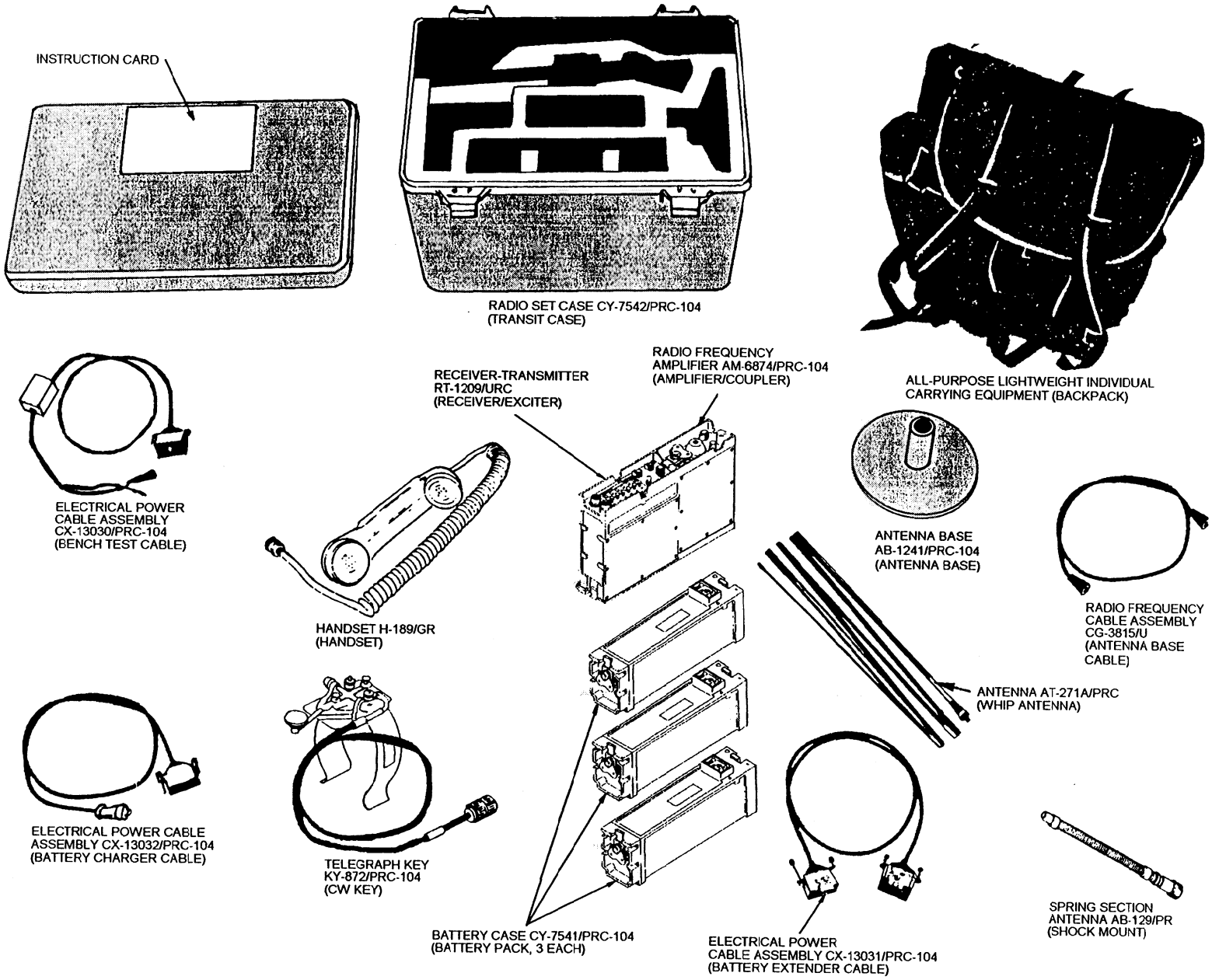


Figure 11-5B.–Radio Set AN/PRC-104 equipment supplied.

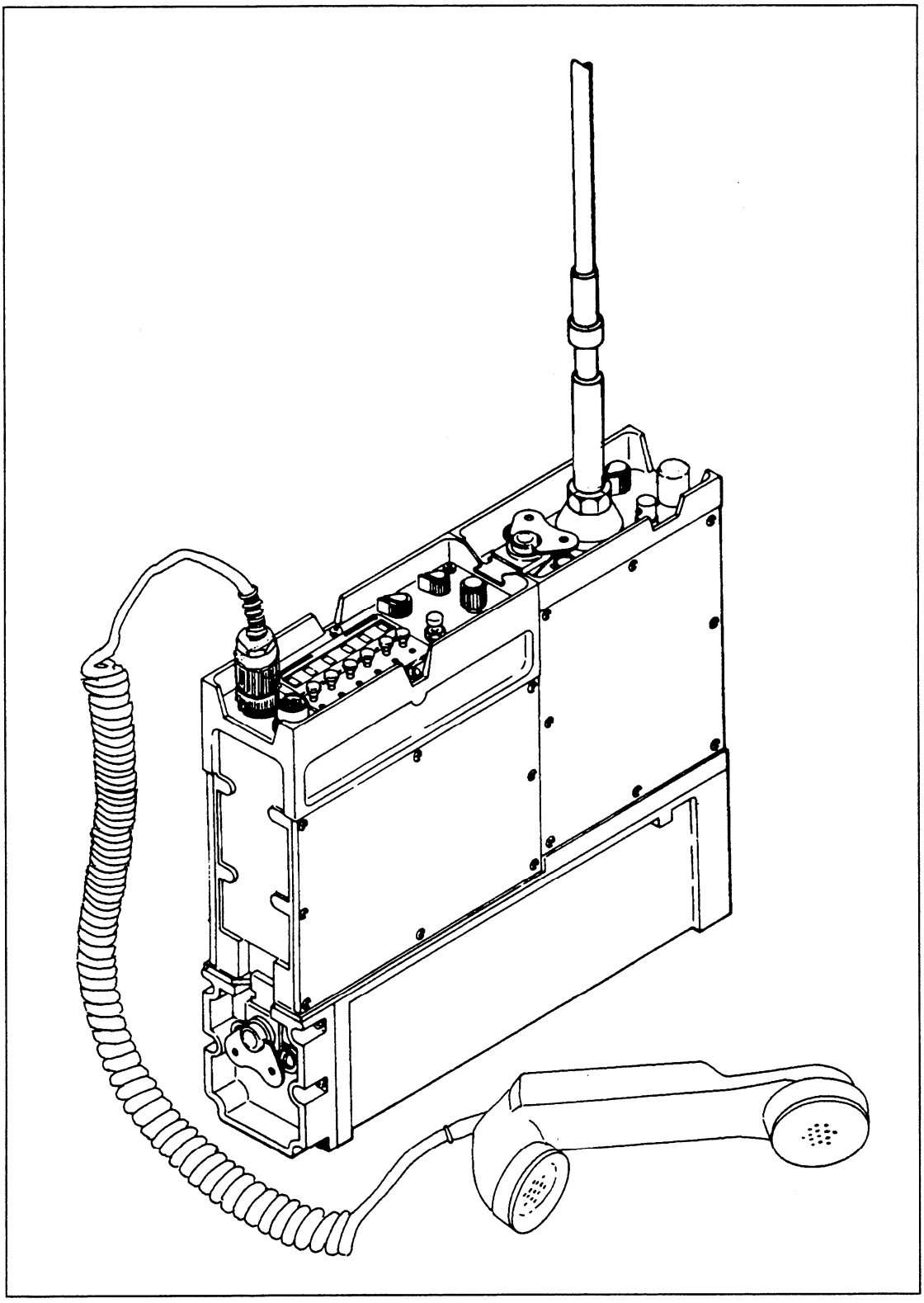


Figure 11-5C.—Radio Set AN/PRC-104 equipment supplied.

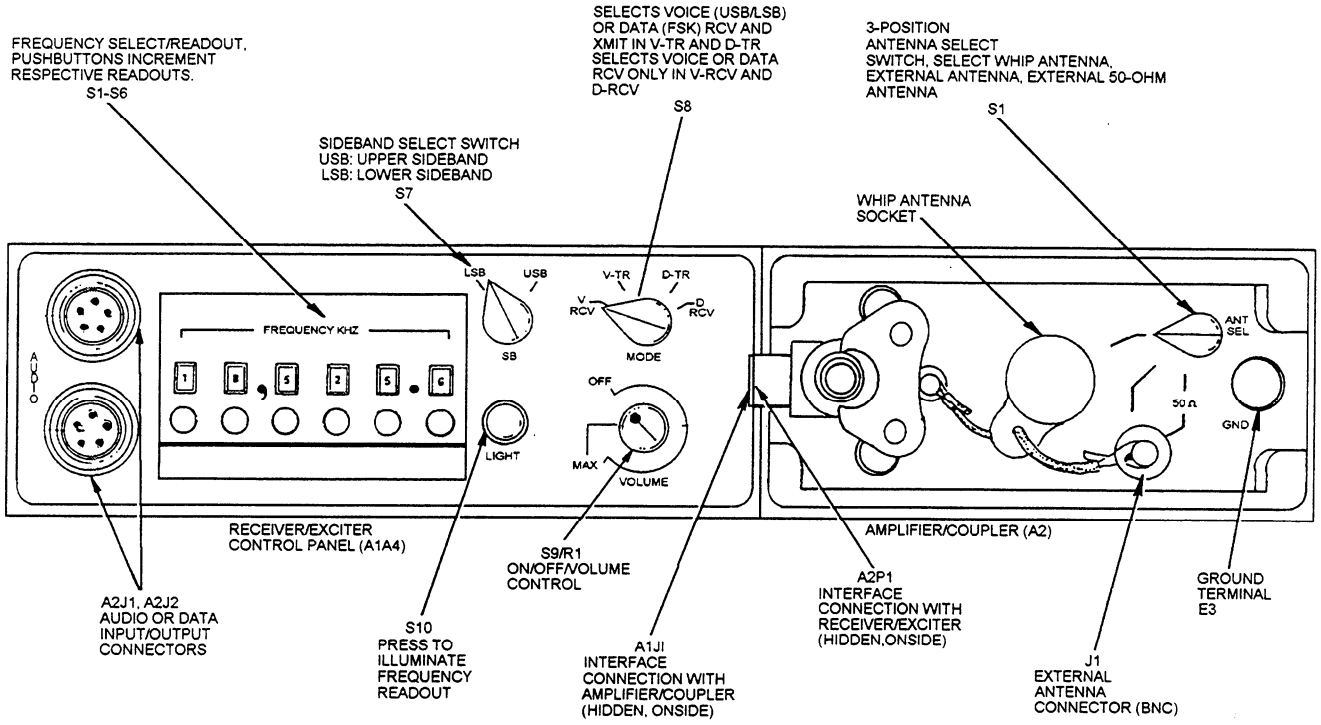


Figure 11-6.-AN/PRC-104 controls and indicators.

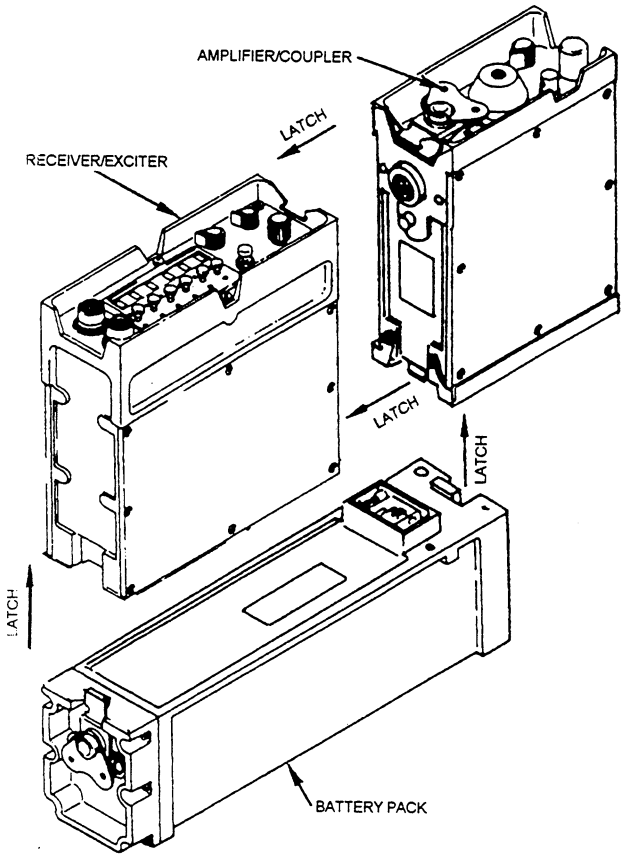


Figure 11-7.—Radio set installation and setup.

therefore, communication is on a one-way reversible (half-duplex) basis. The radio set with whip and handset weighs 15.7 pounds.

BATTERY PACK.— The radio set operates from a nominal 28-volt dc battery pack with an acceptable voltage input between 20 and 32 vdc. The battery pack consists of 16 silver-zinc storage battery cells inside the battery case and is usually latched to the other two units; however, it may be connected to the amplifier/coupler through the 3-foot Electrical Power Cable Assembly CX-13031/PRC-104 (battery extender cable). This connection permits extended battery life by allowing the battery pack to be carried by the operator under the protection of cold weather clothing. Normal life of the battery pack is approximately 16 hours of operation, assuming 10 percent transmit time. The silver-zinc battery is charged using Battery Charger PP-6241/U via the battery charger cable, Electrical Power Cable Assembly CX-13032/PRC-104. For operation without the battery pack, a dc power source can be connected to the amplifier/coupler through the bench test cable, Electrical Power Cable Assembly CX-13030/PRC-104.

FIXED-SITE OPERATION.— When the tactical situation permits, the effective range of the

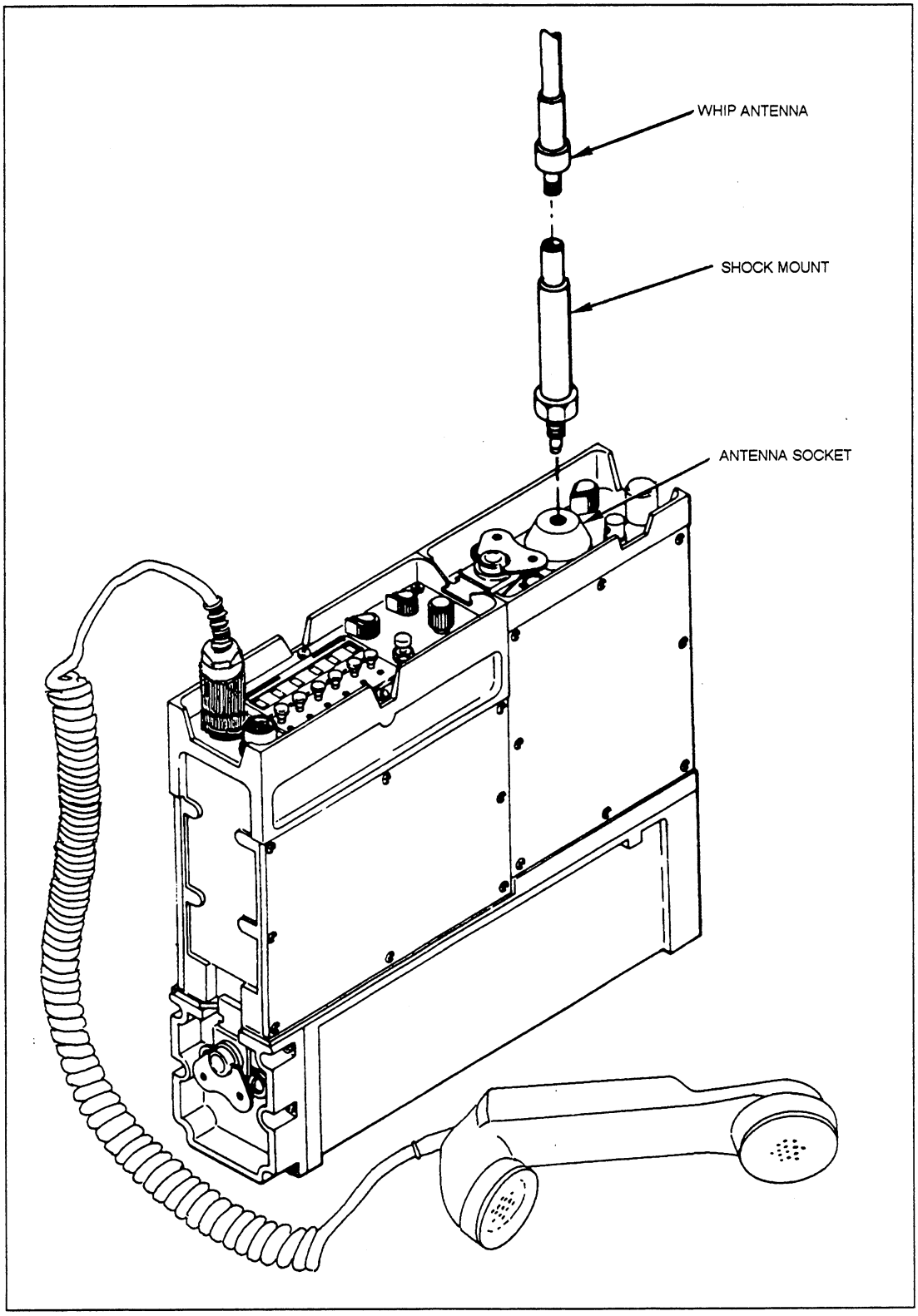


Figure 11-8.—Radio set man-pack setup.

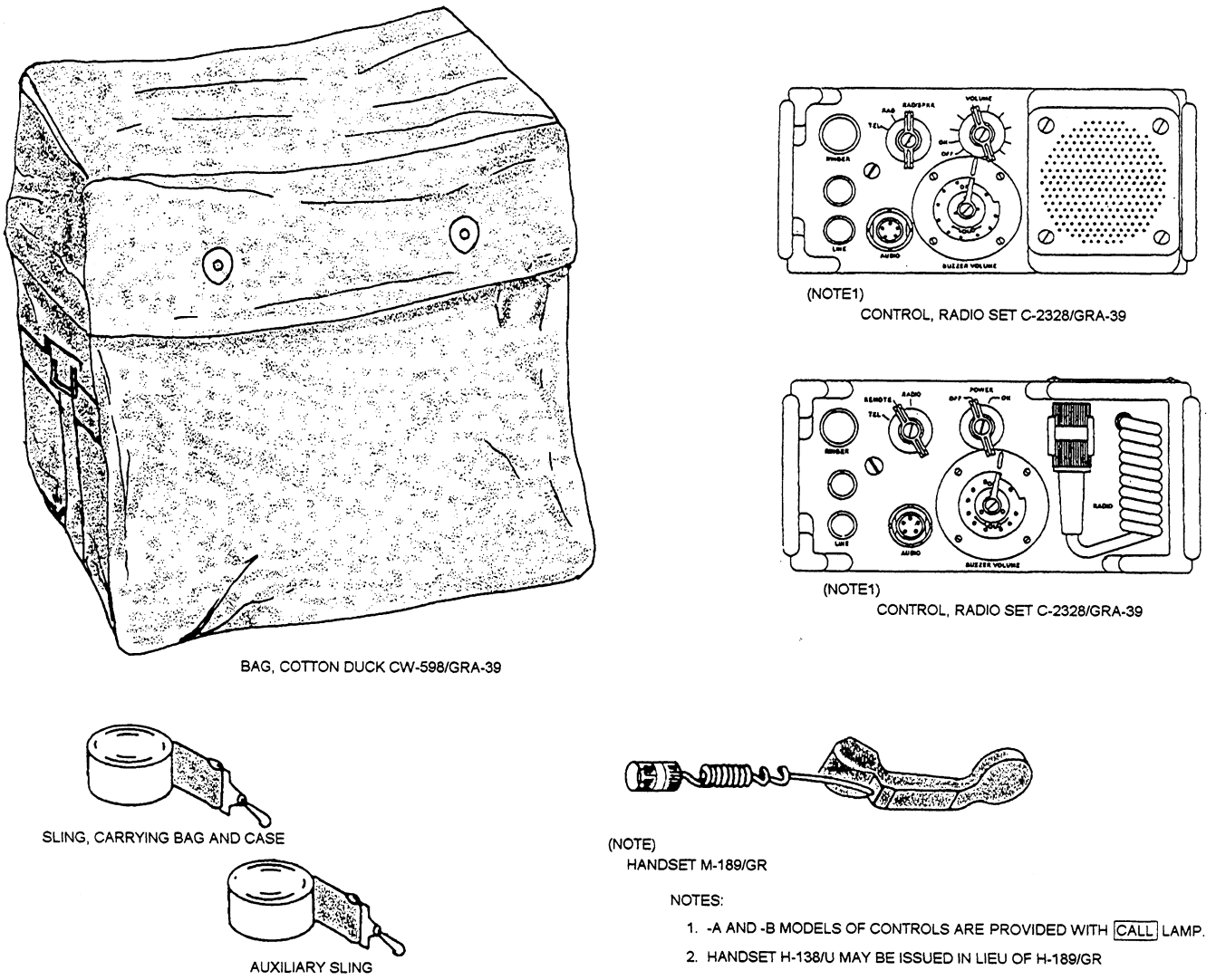


Figure 11-9.—Radio Set Control Group AN/GRA-39, components and their functions.

AN/PRC-104 may be extended by using an AS-2259/GR antenna, the 15-foot near-vertical incidence sky-wave (NVIS) antenna. The Radio Frequency Cable Assembly CG-3815/V (antenna base cable) is used to connect the NVIS Antenna Base AB-124/PRC-104 to the BNC jack of the amplifier/coupler.

Radio Set Control Group AN/GRA-39

Radio Set Control Group AN/GRA-39 (fig. 11-9) provides the capability of remotely controlling a radio set up to a distance of 2 miles, using standard field wire. Remote control allows us to operate the radio set at the desired installation, yet locate the radio set in the best position for more efficient communication between the remote and the local control unit operators. It also provides a buzzer system so the operators may alert one another. The major components of the AN/GRA-39 are the local control unit and the remote control unit.

1. BAG CW-598: Used for storage and transportation of the AN/GRA-39.

2. Sling, carrying bag, and case: Used for transportation of the bag.

3. Auxiliary sling: Used for carrying either the remote or the local receiver/exciter unit separately.

4. Control Group C-2328: Used to transmit or receive over the remote radio set.

5. Control Group C-2329: Connects to the radio being remoted. Connects on the radio audio connector.

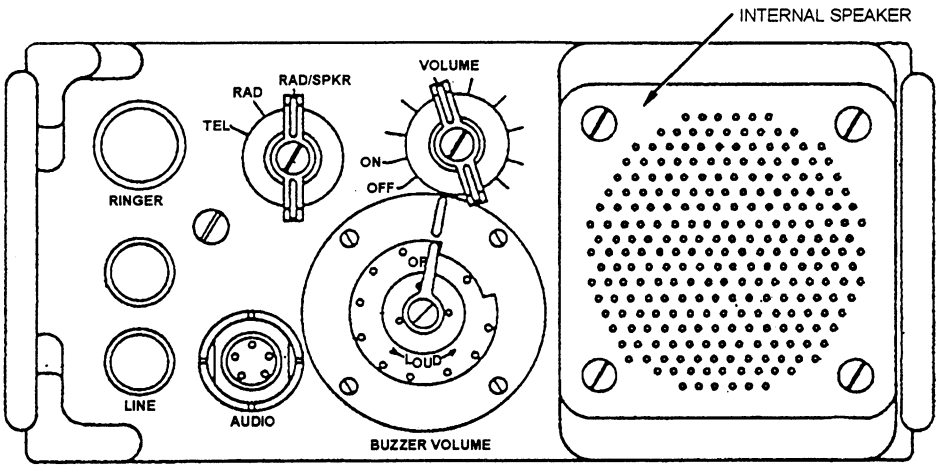


Figure 11-10.—Remote control unit C-2328/GRA-39.

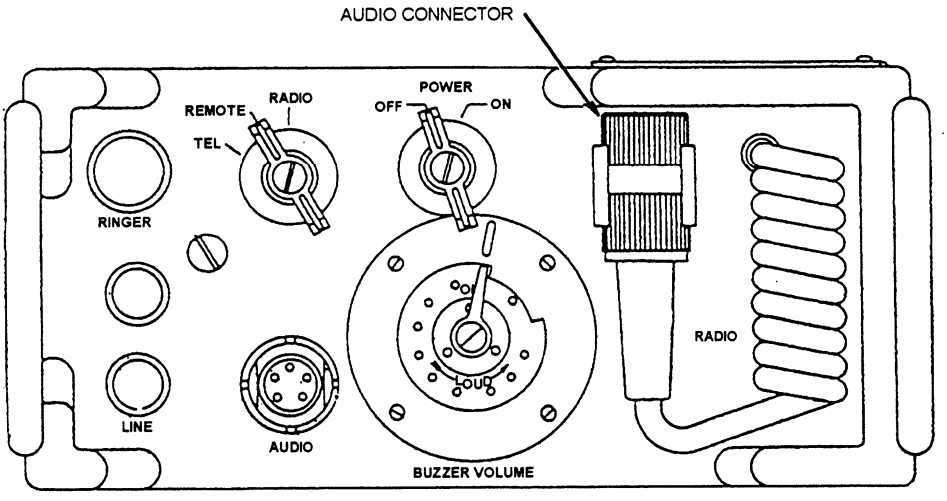


Figure 11-11.—Led control unit C-2329/GRA-39.

6. Handset H-189/PT: Allows an operator to receive and transmit voice communications through a radio.

REMOTE CONTROL UNIT.— The remote control unit (fig. 11-10) allows the operator at the remote site to transmit or receive through a radio set from a distance of up to 2 miles. The power supply (six BA-30s) for the remote control unit has a life expectancy of 24 hours.

LOCAL CONTROL UNIT.— The local control unit (fig. 11-11) is of the same general construction as the remote control unit. The local control unit is connected to the remote control unit by field wire. The local control unit is connected to the radio set being remote with the audio connector. The power supply, composed of six BA-30s, for the local control unit has a life expectancy of 72 hours.

SETUP PROCEDURES USING RADIO SET AN/PRC-77.— The setup procedures for the AN/PRC-77 radio set used in conjunction with the AN/GRA-39 radio control group includes the following steps:

1. Setup the radio set and establish communication with a distant station before removing.

2. Ensure the Radio Control Group AN/GRA-39 is complete and that 12 BA-30s and field wire are available.

3. Installation of the batteries requires the following procedures:

- For the local control unit (C-2329):
  a. Unsnap the two rear clamps and remove the rear cover.
  b. Install the size BA-30 batteries according to instructions on the rear of the case.
  c. Replace the rear cover and clamp it.
  d. Locate the local control unit near enough to the radio so the audio connector cord can reach it.
- For the remote control unit (C-2328):
  a. Perform the procedure in (a) through (c) above.
  b. Position the remote control unit as required (up to 2 miles from the local control unit).

4. To make appropriate connections, you must ensure the procedures indicated below are followed carefully:

- For the local control unit (C-2329):
  a. Remove the radio connector from the retaining clip on the front panel.
  b. Connect the radio connector to the audio connector of the radio set; ensure proper connection is made.
  c. Strip the insulation from the field wire (1/2 inch) and connect the wire to the binding posts by pressing the post down, inserting the wire into the slots provided, and releasing the posts.
  d. Connect the handset from the radio set to the local control unit.
- For the remote control unit (C-2328):
  a. Strip the insulation from the ends (1/2 inch) and connect the wire to the binding post by pressing the posts down, inserting the field wire into-the slots provided, and release.

WARNING

DO NOT PRESS THE RINGER BUTTON WHILE CONNECTING THE FIELD WIRE TO THE LINE BINDING POSTS.

  b. Connect the handset provided with the AN/GRA-39, to the audio connector ensuring a secure connection.

OPERATING PROCEDURES.— Perform the following actions:

- For the local control unit (C-2329):
  a. Turn the POWER switch ON.
  b. Set the BUZZER VOLUME/LAMP (the one desired) near mid-range.
- For the remote control unit (C-2328):
  a. Turn the volume control to mid-range.
  b. Set the BUZZER VOLUME/LAMP (the one desired) to near mid-range.

The Radio Set Control Group AN/GRA-39 provides three types of operation:

1. Telephone communications between remote and local control unit operation.
   a. Press the ringer button on the front panel several times to gain the attention of the other operator.
   b. Set the remote control unit TEL/RAD/ RAD-SPKR switch to TEL.
   c. Turn and hold the local unit TEL/ REMOTE/RADIO switch to TEL.
   d. Press the handset press-to-talk switch to talk to the other operator, release to receive.

2. Radio set transmission and reception from the local unit.
   a. Set and hold the TEL/REMOTE/RADIO switch to RADIO.
   b. Press the handset press-to-talk switch to transmit, release to receive.

3. Radio set transmission and reception from the remote control unit.
   a. Set TEL/REMOTE/RAD1O switch on the local control unit in the remote position.
   b. Local operator adjust volume on radio set for a comfortable listening level.
   c. Set the TEL/RAD/RAD-SPKR switch on the remote unit to RAD or RAD-SPKR.
   d. Adjust the volume control to the desired listening level.

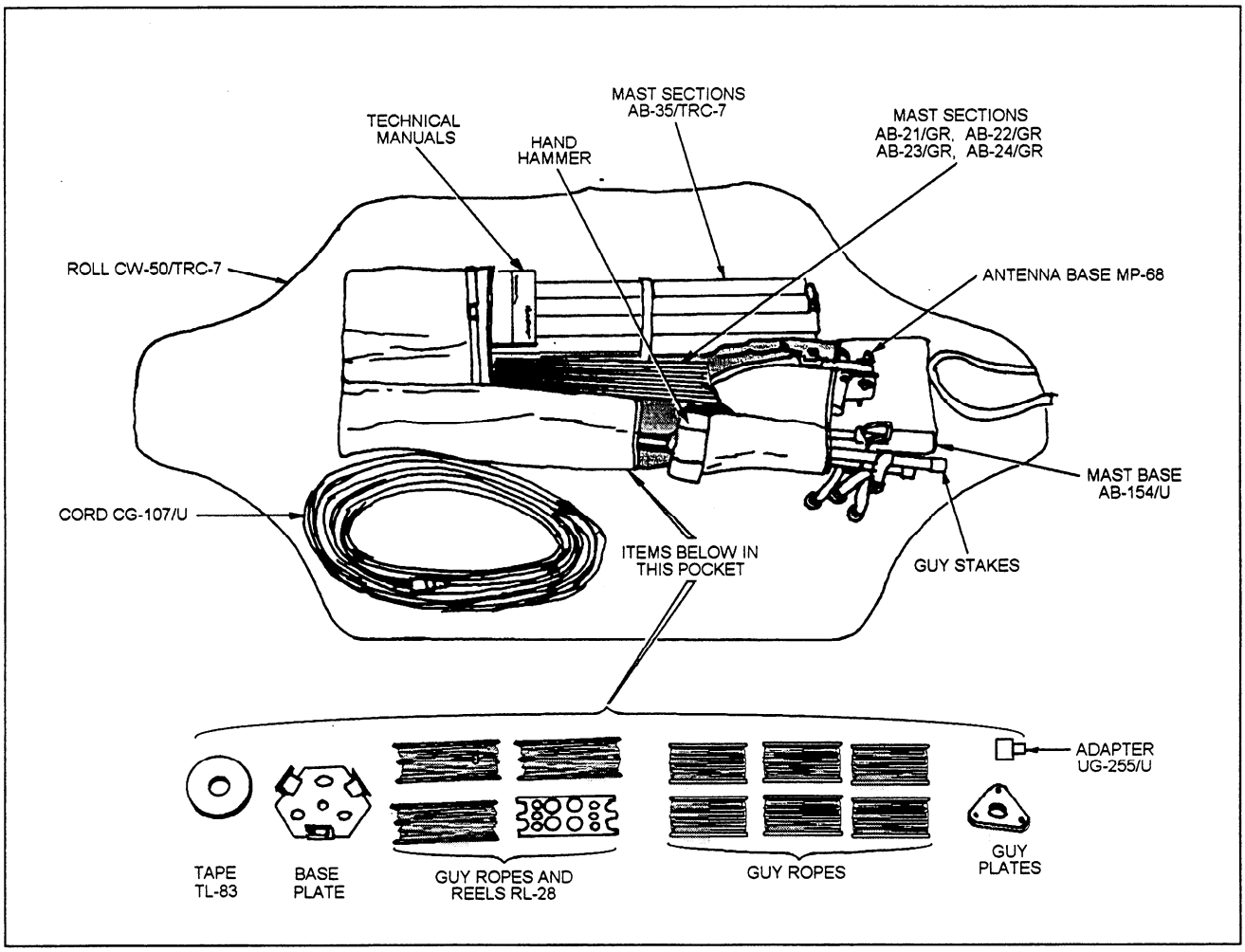


Figure 11-12.—Antenna equipment RC-292, components and spare parts.

e. Press the handset push-to-talk switch to transmit; release to receive.

f. If chatter (a motor boat sound) is heard in the speaker or handset, turn the volume down on the radio set and re-adjust the volume from the remote control unit.

The three operating procedures described above should be applied each time the AN/GRA-39 is put into operation, because it allows the operator to hold a complete operational check of the Radio Set Control AN/GRA-39.

SECURING PROCEDURE.— To secure the AN/GRA-39, perform the following actions:

1. Turn the power switches to OFF on both units.

2. Remove the batteries.

3. Disconnect the wires, handsets, and radio connector.

4. Store all components in the carrying bag and return it to storage after preventative maintenance has been performed by the operator.

ANTENNA EQUIPMENT RC-292

The RC-292 antenna (fig. 11-12) is an elevated, wide-band, modified ground-plane antenna designed to increase the range of radio sets in the 30 to 76 MHz range. The reception range for the RC-292 is 8 to 36 miles, depending on the type of radio set being used and the terrain.

The RC-292 can be used with the AN/PRC-77, AN/PRC-104, AN/GRC-160, and AN/GRA-39.

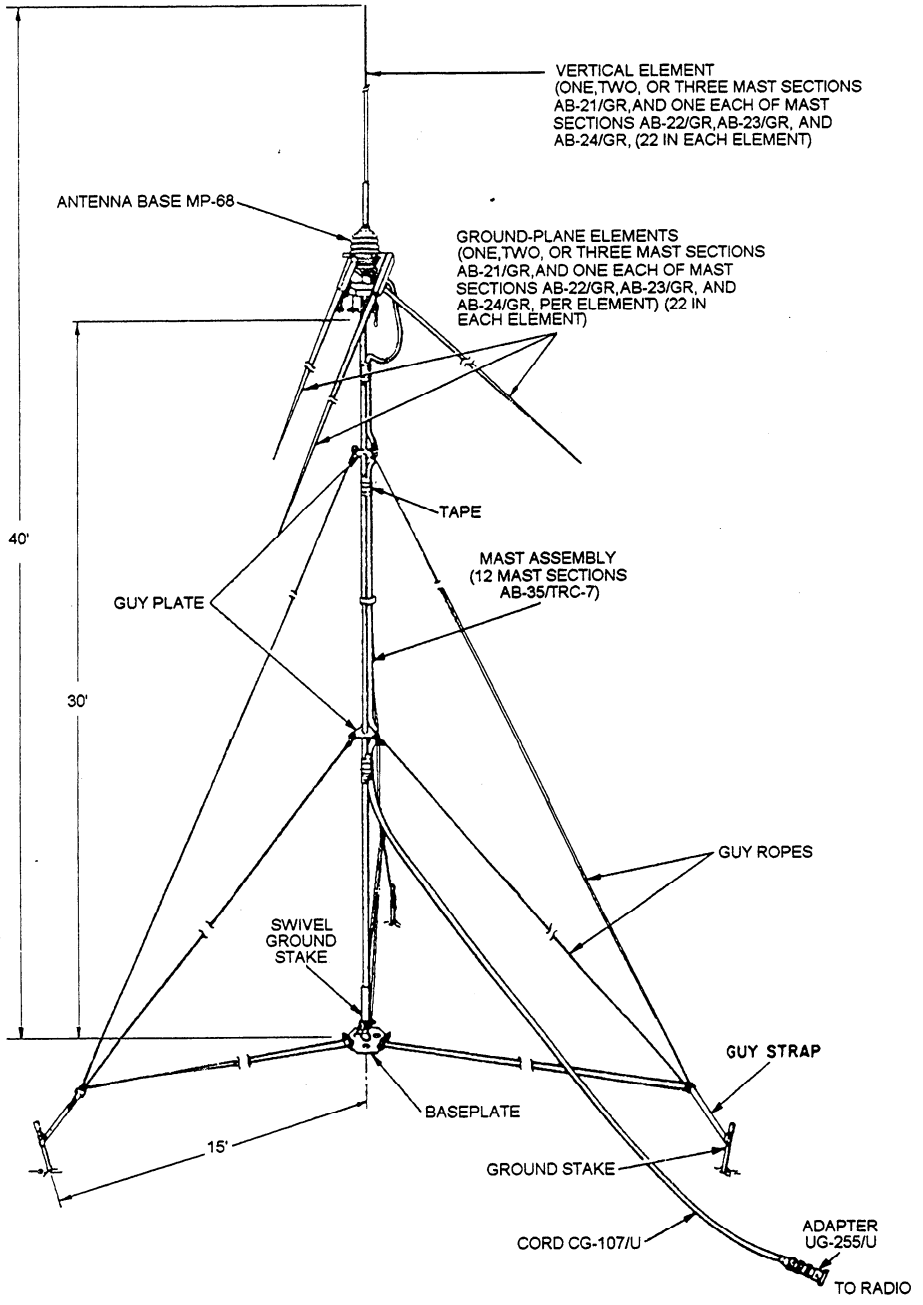


Figure 11-13.—Antenna RC-292 setup.

The antenna (fig. 11-13) consists of one vertical radiating element that makes an angle of 140 degrees with the vertical element. Antenna Base MP-68 mounts the four antenna elements and provides for connecting the antenna to the radio set by the CG-107/U. Twelve Mast Sections AB-35/TRC-7, joined together, form the 30-foot mast assembly for elevating above ground. The mast assembly is supported on Mast Base Assembly AB-154/U installed in the baseplate and is held in a vertical position by six guy ropes. The lengths of the antenna elements are adjusted for different frequency ranges by changing the number of mast sections that make up the antenna elements. The swivel stake on which the mast is supported facilitates lowering of the antenna to make such changes. The equipment maybe transported by hand (manually) or by vehicle. When disassembled, the RC-292 should be packed in a canvas roll.

The components of the antenna RC-292 are as follows:

1. Antenna Elements. The vertical radiating element and three ground-plane elements consist of one, two, or three Mast Sections AB-21/GR, and one each of

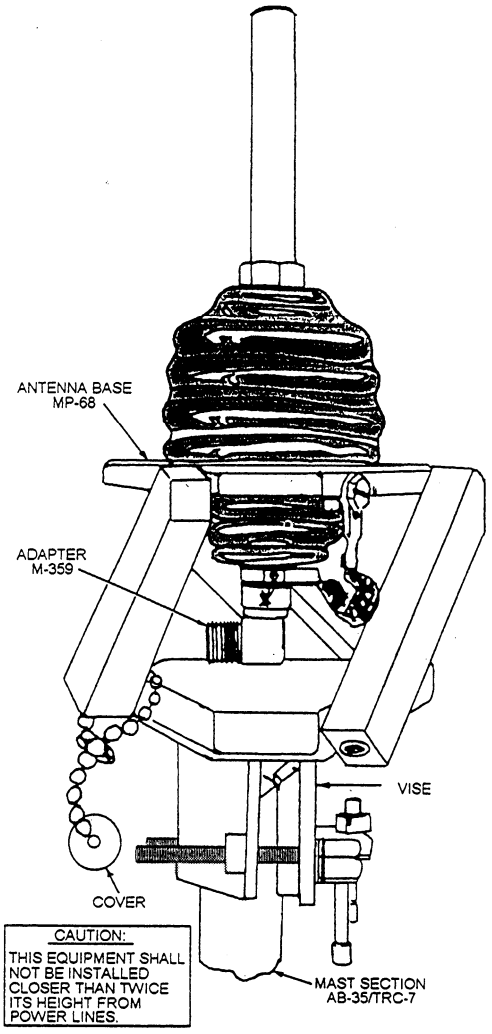


Figure 11-14.—Antenna base MP-68 mounted on mast.

Mast Sections AB-22/GR, AB-23/GR, and AB-24/GR. The mast sections are copper plated, painted tubes of high-strength steel that can be screwed together.

2. Antenna Base MP-68. The MP-68 (fig. 11-14) is comprised of a ceramic feed-through insulator, sockets for mounting the antenna elements, an M-359 adapter, and a vise. The feed-through insulator permits the vertical radiating antenna element socket to be connected through the M-359 adapter to the center conductor of the CG-107/U. The three ground-plane sockets and the outer conductor of the CG-107/U connect to the metal framework of the antenna base. The vise enables the antenna base to be clamped to the top of the supporting mast assembly.

3. Mast Section AB-35/TRC-7. Twelve sections are provided for assembling the 30-foot supporting mast assembly. Each section is tubular and has a male and female end that permit the sections to be fitted together.

4. Mast Base Assembly AB-154/U. This assembly consists of Guy Stake GP101/U attached to a yoke and clevis pin assembly. The lowermost Mast Section Assembly AB-35/TRC7 is placed in the yoke and clevis pin assembly. The yoke and clevis pin arrangement allows the mast assembly to be lowered to the ground by pivoting around the stake.

5. Guy Ropes, Guy Plates, and Guy Stakes. These items hold the mast assembly in a vertical position (fig. 11-13).

6. Reel Rl-28. Three of these reels are provided; two are wound on each of the three reels.

7. Cable Assembly, Radio Frequency Cord CG-107/U. The CG-107/U is a 68-foot length of 50-ohm, solid-dielectric, coaxial radio-frequency (rf) cable, terminated in male Plugs PL-259-A.

8. Adapter M-442. The M-442 consists of an angle bracket provided with Socket SO-259, an insulated lead, and a ground lead that permits the CG-107/U to be easily connected to Radio Sets SCR-508, SCR-528, SCR-608, and SCR-628.

9. Adapter Connector UG-255/U. The UG-255/U is required to adapt the CG-107/U to Receiver-Transmitters RT-66/GRC, RT-67/GRC, T-68/GRC, RT-246/VRC, RT-524/VRC, and Radio Sets AN/PRC-8, AN/PRC-9, and AN/PRC-10.

10. Roll CW-50/TRC-7. The CW-50/TRC-7 is a canvas roll with pockets and straps to hold the antenna components for transportation in the field. A shoulder strap is provided for easy carrying.

11. Guy Plate. One guy plate is inserted between the sixth and seventh sections of the mast assembly and another between the eleventh and twelfth sections. The upper and lower guy ropes attach to these plates.

WARNING

DO NOT CONNECT THE POWER CABLE BEFORE CONNECTING THE ANTENNA. HIGH RADIO-FREQUENCY (RF) VOLTAGES ARE PRESENT IN THE ANTENNA CONNECTOR WHEN THE TRANSMITTER POWER IS ON. ALSO, DO NOT TOUCH THE ANTENNA ABOVE THE INSULATING BOOT DURING TRANSMISSION BECAUSE YOU CAN BE SEVERELY BURNED.

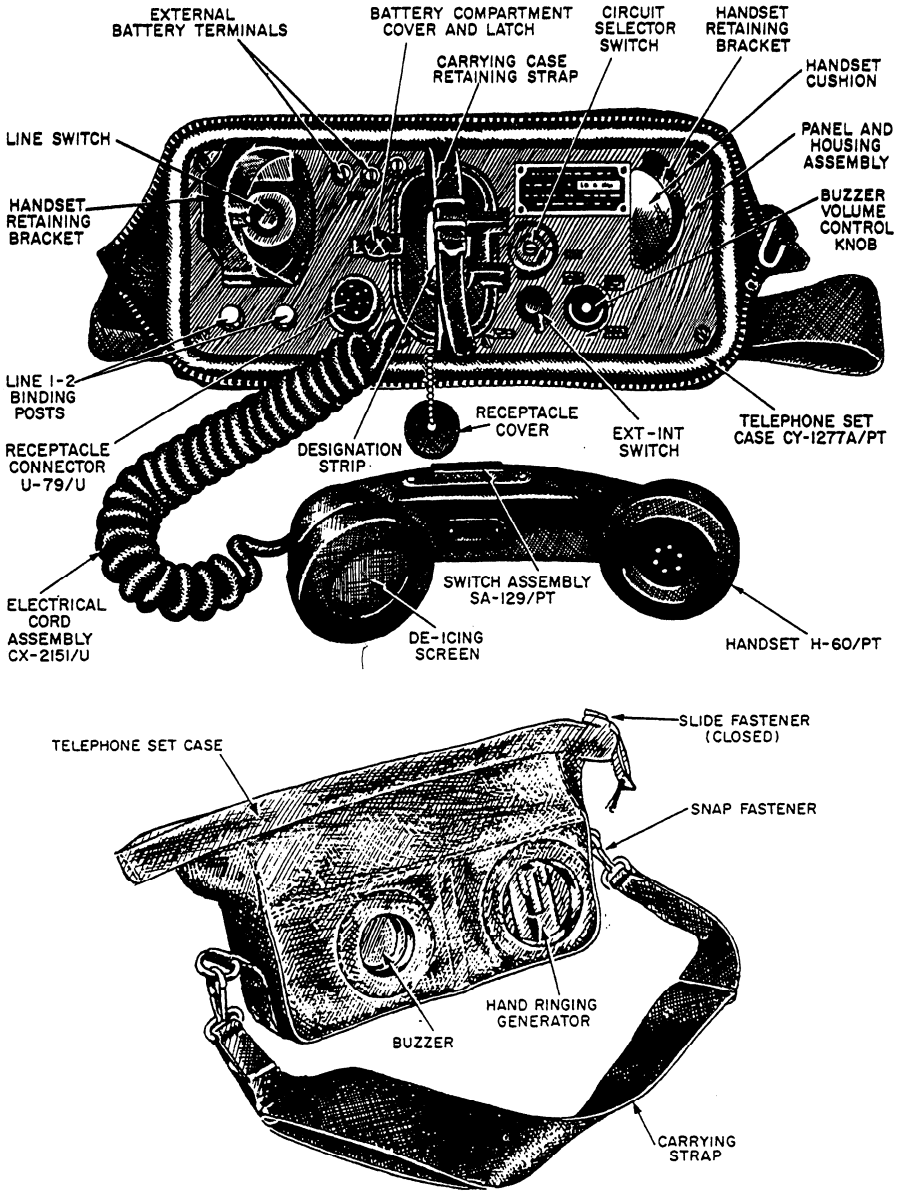


Figure 11-15.—TA-312/PT telephone set.

VINSON COMSEC KY-57

The KY-57 is the primary piece of VINSON COMSEC equipment used today for voice/data encryption on VHF radios and for a large number of wireline devices. When hooked to a radio, a teletype piece of gear, or a telephone device, the KY-57 can scramble (encrypt) the information being passed through it so only stations on our net having the same key as we do receive the information. The KY-57 uses electronic keys to encrypt the information, can be rekeyed remotely, and can accept signal fades up to 12 seconds without losing synchronization with the transmitting station. The KY-57 can be set up in the man-pack, vehicular, or fixed-site configuration.

TA-312/PT TELEPHONE

The TA-312/PT telephone set shown in figure 11-15 is a lightweight, waterproof, battery-powered, field telephone designed for local-battery or common-battery circuits. It has facilities for operating push-to-talk radio circuits and a range of 14 to 22 miles. The set weighs about 9 1/2 pounds.

The TA-312/PT consists of three primary components.

1. The telephone set case, made of reinforced canvas.

2. The panel and housing assembly that encloses all electrical components.

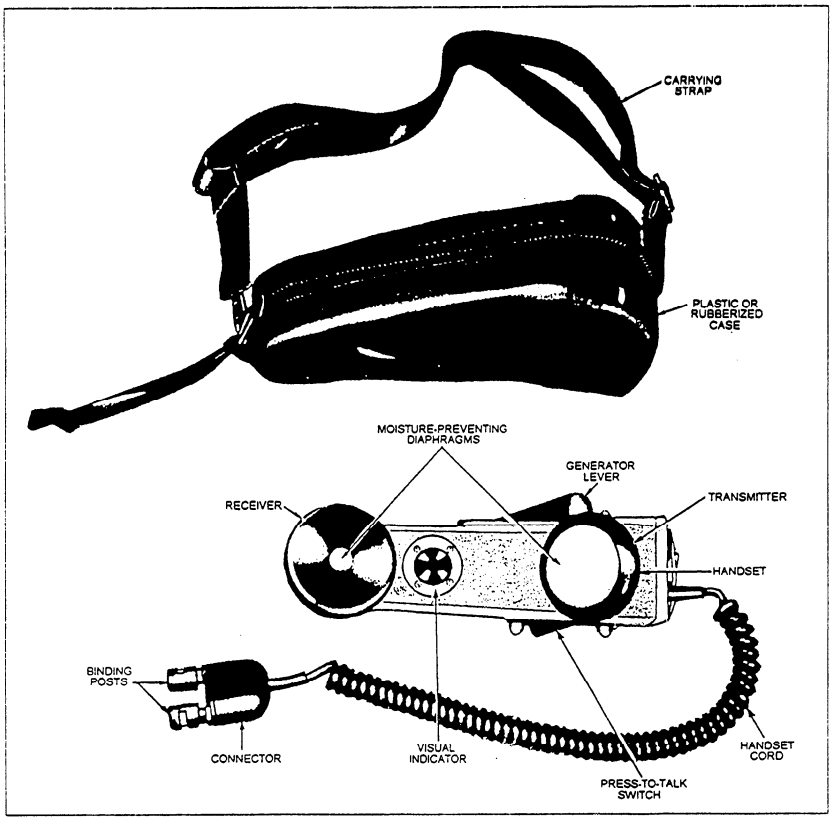


Figure 11-16.—TA-1/PT telephone set.

3. A transmitter, a receiver with a push-to-talk switch, and a retractable cord.

The power supply for the transmitter consists of two dry-cell (BA-30) batteries in series furnishing 3 volts for local battery (LB) operation. The batteries are used on both local-battery and common-battery signaling (CBS) circuits. One battery is installed in the battery compartment with the positive end up; the other with the positive end down. After you install the batteries, close the battery compartment cover and fasten the cover latch. An external, 3-volt battery source maybe used in place of the two BA-30s. Connect the back from the external batteries to the BAT binding posts on the panel. No batteries are required for common-battery operation.

In order to operate the TA-312 with the handset, follow the instructions listed below.

1. Put the EXT-INT SWITCH in the INT position.

2. To place a call in LB operation, leave the handset in the retaining brackets and turn the generator hand crank. Remove the handset from the brackets and listen for the party you are calling to answer.

3. To place a call in CB operation, remove the handset from the retaining brackets and listen for the operator to answer.

4. To talk and listen in CBS operation, push in on the press-to-talk switch when you talk release it when you listen.

5. To talk and listen in CB operation, you do not operate the press-to-talk switch.

6. To adjust the buzzer volume, request a distant party to signal; then place the handset in the brackets. When a signal is received, rotate the buzzer control for desired volume.

7. To complete the call, place the handset in the retaining brackets. When the set is connected through an LB switchboard, ring off by turning the hand crank.

TA-1/PT TELEPHONE

The TA-1/PT telephone set is a lightweight, waterproof, sound-powered, field telephone for use on field-wire lines to communicate with other field telephones or local, battery-operated switchboards. The TA-1/PT is equipped with a visual, incoming-signal indicator and a generator ringer. It has a talking range of 3 to 6 miles, which is ideal for use on a listening post. The set weighs about 2.7 pounds. The basic parts of the set are shown in figure 11-16.

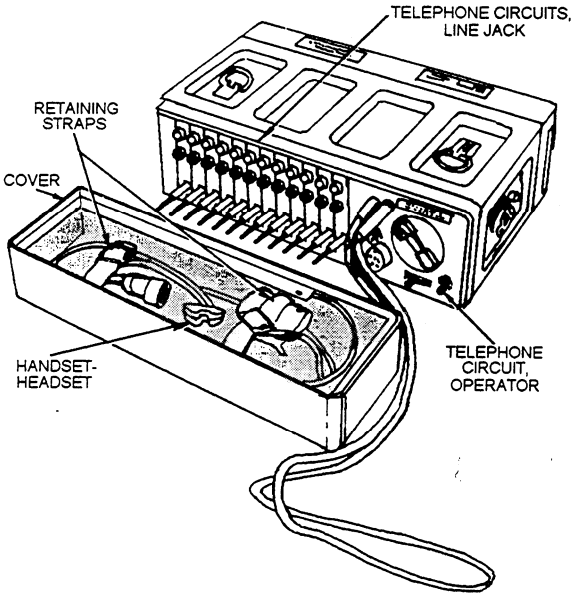


Figure 11-17.—Manua1 SB-22/PT telephone switchboard.

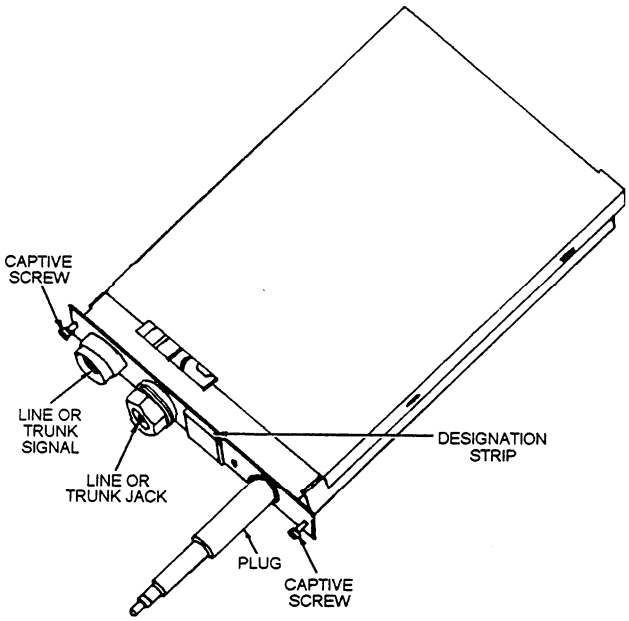


Figure 11-19.—TA-222/PT line and trunk pack.

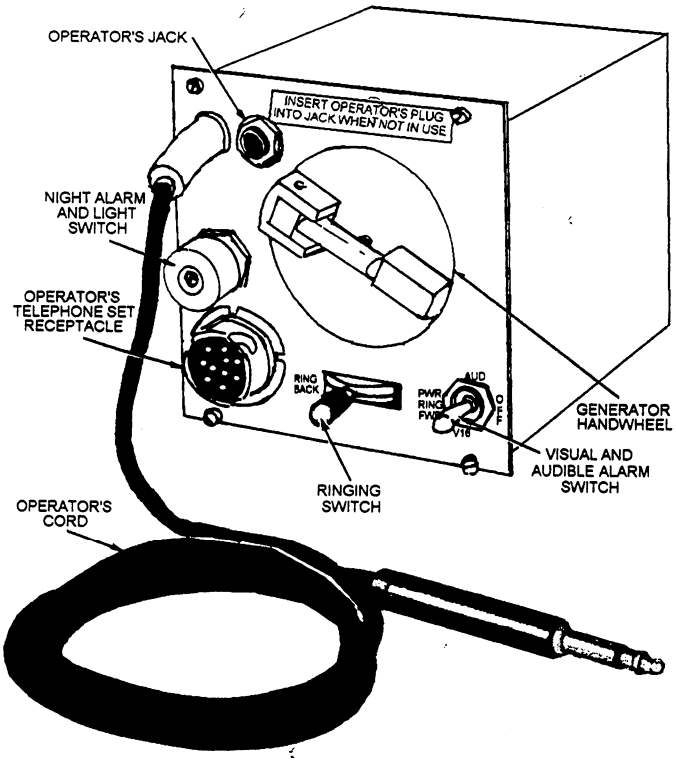


Figure 11-18.—TA-221/PT operator's pack.

The TA-1/PT can be used with the SB-22/PT telephone switchboard. To place an outgoing call with the TA-1/PT, first press the generator lever. Then, listen for the distant party to answer. When you are ready to talk press the talk switch. When listening, release the Dress-to-talk switch. The buzzer sounds for an incoming call except when the buzzer volume control is set in the OFF position. The visual indicator shows four white, luminous markings that remain visible until you press the talk switch. Rotate the buzzer volume knob to adjust the buzzer volume. For maximum volume, rotate the knob counterclockwise as far as possible. For volume less than maximum, first request the distant party or switchboard for a ringing signal. When the buzzer sounds, rotate the buzzer volume knob clockwise until you obtain the desired volume.

SB-22/PT TELEPHONE SWITCHBOARD

The SB-22/PT telephone switchboard shown in figure 11-17 is a lightweight, battery-operated, field switchboard that has 12 interconnecting voice-frequency circuits. The SB-22/PT is normally used to interconnect local-battery telephone circuits, remote-controlled radio circuits, and voice-frequency teletypewriter circuits. Four BA-30 flashlight batteries provide 3 volts of direct current for its operation. The SB-22/PT has a range of 14 to 22 miles. The switchboard unit weighs about 30 pounds.

The SB-22/PT consists of four basic parts: the operator's pack (fig. 11-18); the line and trunk pack (fig. 11-19); the accessory kits (fig. 11-20); and the handset-headset (fig. 11-21).

Before operating the SB-22/PT switchboard, you should first become familiar with the different controls

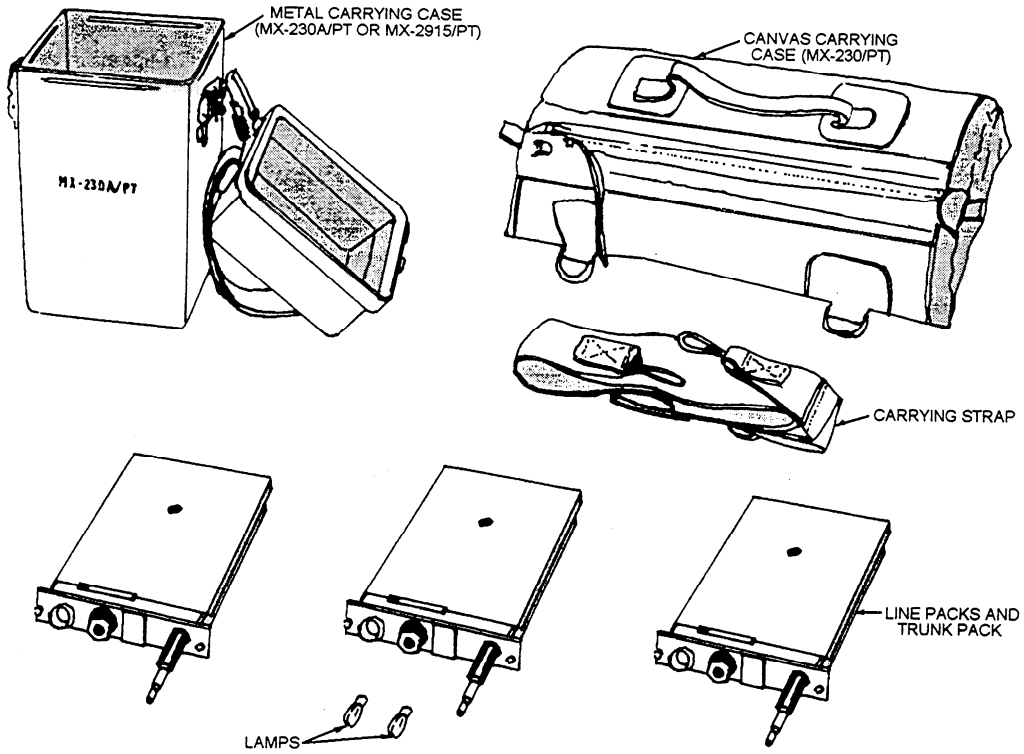


Figure 11-20.—Accessory kits, MX-230/PT, MX-230A/PT, and MX-2915/PT.

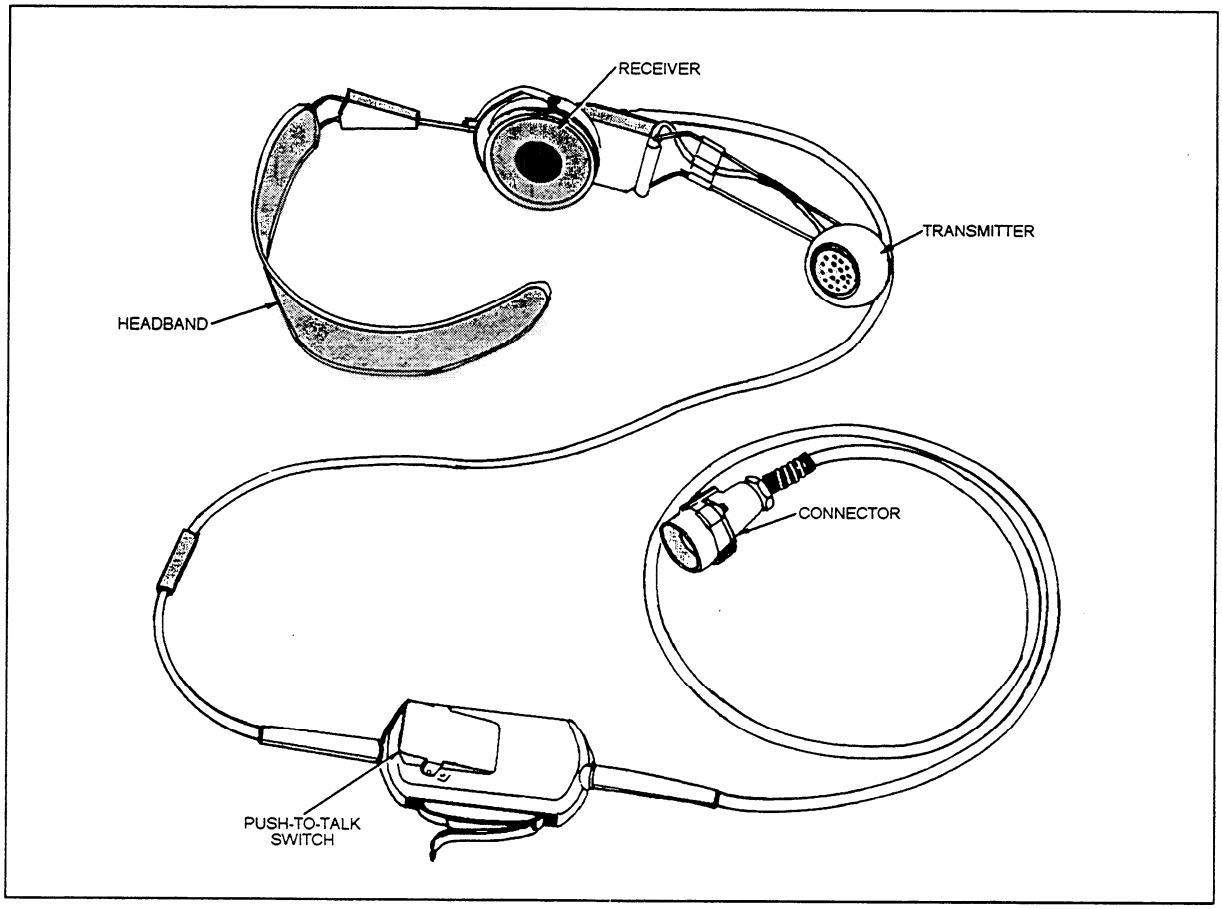


Figure 11-21.—Handset-headset, H81A/U.

Control	Function	
	Switch position	
Ringing switch.	RING BACK . .	Connects ringing current to the calling party's line.
	PWR RING . . FWD	Connects ringing current to the called party's line when an external source of ringing current is used.
Night alarm and light switch.	NA-IN.	Permits the lamp to be used as a silent alarm.
	LITE-OUT . . .	Lights the lamp to illuminate the switchboard.
Visual and audible alarm switch.	OFF.	Disconnects the alarm circuit.
	VIS	Connects the lamp to the alarm circuit.
	AUD	Connects a buzzer to the alarm circuit.
Operator's cord and plug.	Connects the operator's circuit to the line or trunk pack.	
Operator's jack.	Disconnects the operator's telephone set battery when the operator's cord plug is inserted.	
Generator handwheel.	Provides ringing current when turned.	
Operator's telephone set receptacle.	Permits connection of the operator's telephone set to the operator's pack.	

Figure 11-22.—Operator's pack control and function.

and their functions. Figure 11-22 lists the controls and their functions in operating the OPERATOR'S PACK; figure 11-23 lists the controls and their functions in operating the LINE and TRUCK PACKS.

To put the SB-22/PT switchboard into operation, you first put on your HANDSET-HEADSET and

Control	Function
Jack (one for each line and trunk pack).	Provides access to the line or trunk.
Cord plug (one for each line or trunk pack).	Permits interconnection of lines or trunks through the jacks.
Signal (one for each line or trunk pack).	Indicates the circuit requires attention when operated to the *white* position.

Figure 11-23.—Line and trunk packs control and function.

connect it to the switchboard in the following manner:

1. Place the headset (fig. 11-21) over your head so the receiver covers one ear.

2. Position the transmitter directly in front of your mouth.

3. Align the connector (fig. 11-21) on your headset cord with the receptacle on the operator's pack (fig. 11-18). Push it into the connector and turn it to the right so it locks in place.

NOTE: The spacing of the lugs around the inside of the connector determines the position of the connector.

4. Clip the PUSH-TO-TALK SWITCH on the handset-headset to the front of your shirt.

After inserting the plug of your operating cord into the operator's pack (fig. 11-18), place the push-to-talk switch into any of the positions shown in figure 11-24.

When answering the calling party, watch the signals on the front of the line packs (fig. 11-19); the line signals turn from black to white. Follow the procedures below to answer the incoming call (fig. 11-25, view A).

1. Remove the plug of the operator's cord from the operator's jack and insert it into the jack that shows the white line signal (calling party's line signal).

2. Obtain the called party's name or number from the calling party and then proceed to interconnect the parties.

When connecting the calling party to the called party (fig. 11-25, view B), pull out the cord in the calling party's line and insert the plug into the called party's line

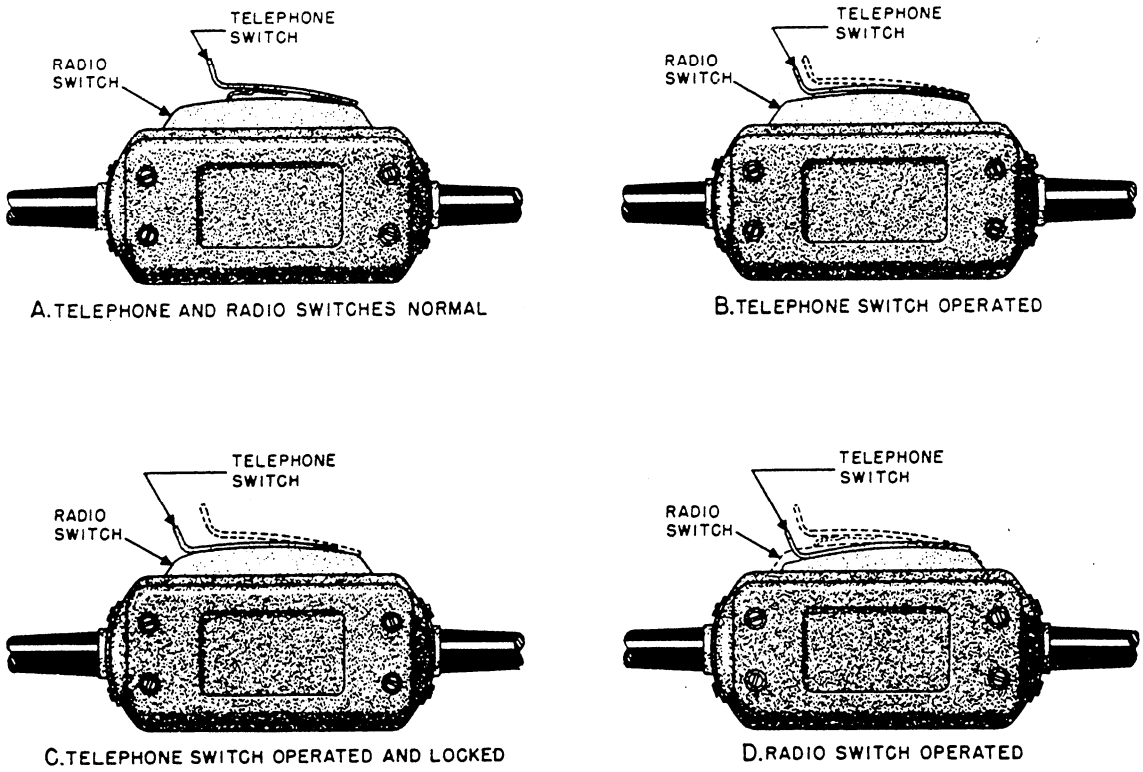


Figure 11-24.–Operating positions of the push-to-talk switch.

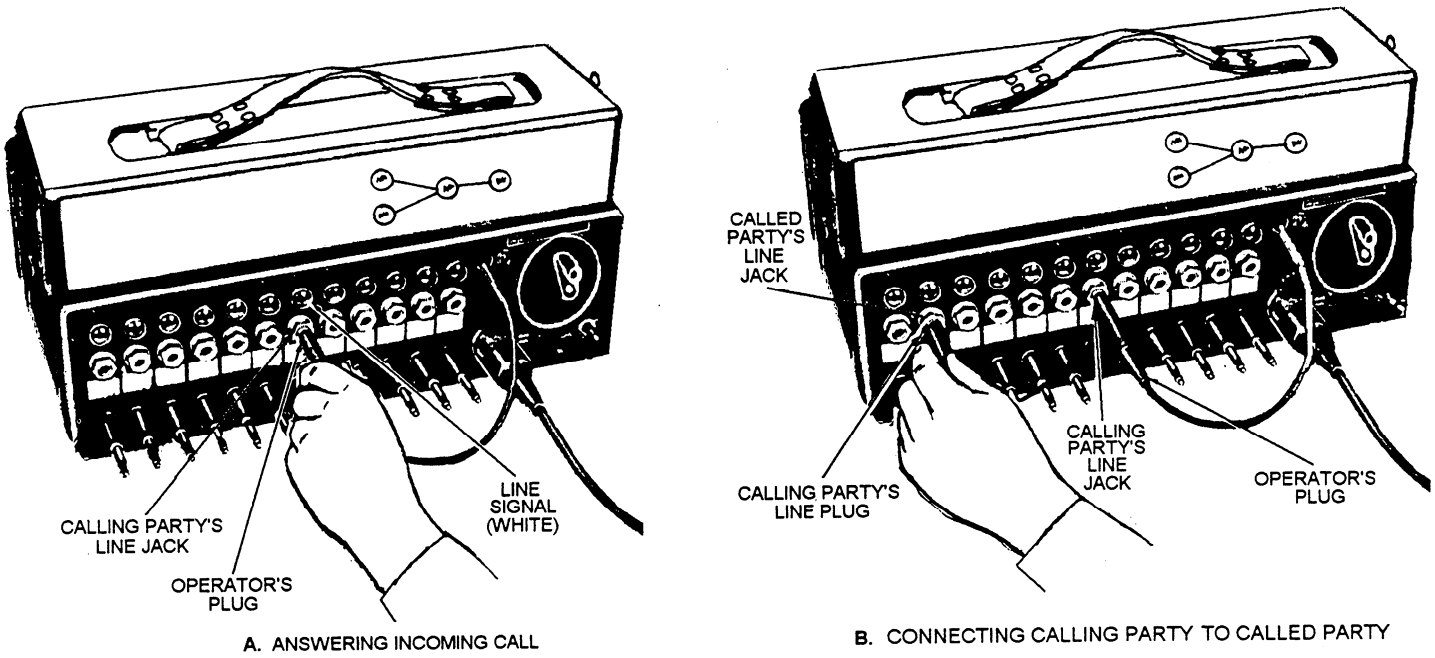


Figure 11-25A and B.—Steps required to connect local calls through the SB-22/PT switchboard.

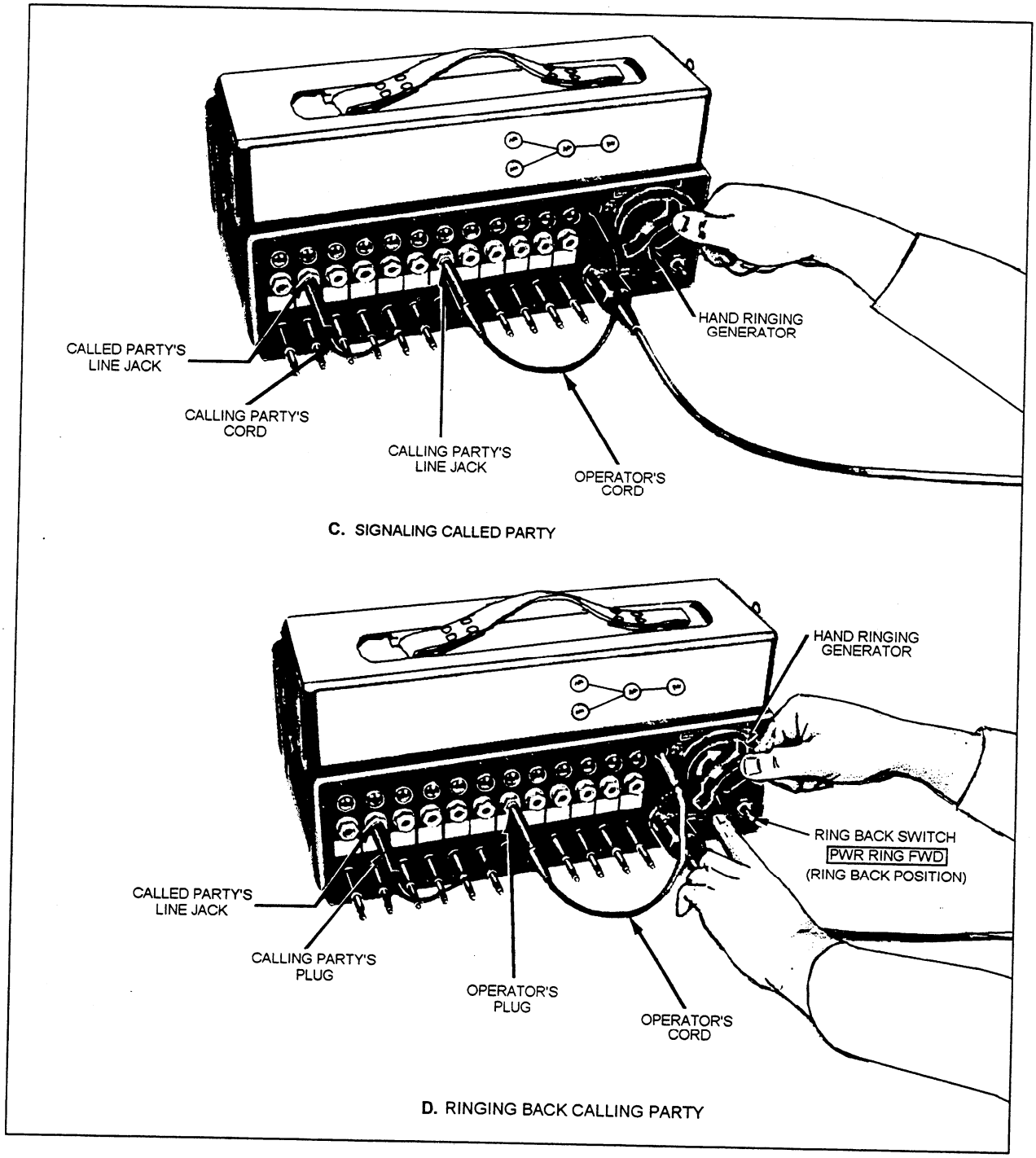


Figure 11-25 C and D.—Steps required to connect local calls through the SB-22/PT switchboard.

jack (fig. 11-25, view C). Then, signal the called party by turning the hand-ringing generator (fig. 11-18) rapidly for approximately 10 turns. Do NOT operate the RING BACK-PWR RING FWD switch to either position. Wait for the called party to answer. After the called party answers, remove the operator's plug from the called party's jack and insert it into the operator's jack.

After the calling and called parties finish talking, both parties should ring off. The ring-off signal causes the calling party's line to turn white. If you should have to challenge the ring-off signal, remove the operator's plug from the operator's jack and insert it into the calling party's jack Ask the parties if they have finished. If no one answers, disconnect the circuit. Remove the operator's plug from the calling party's jack and insert it into the operator's jack.

If the calling party disconnects before the called party answers or before the conversation is completed,

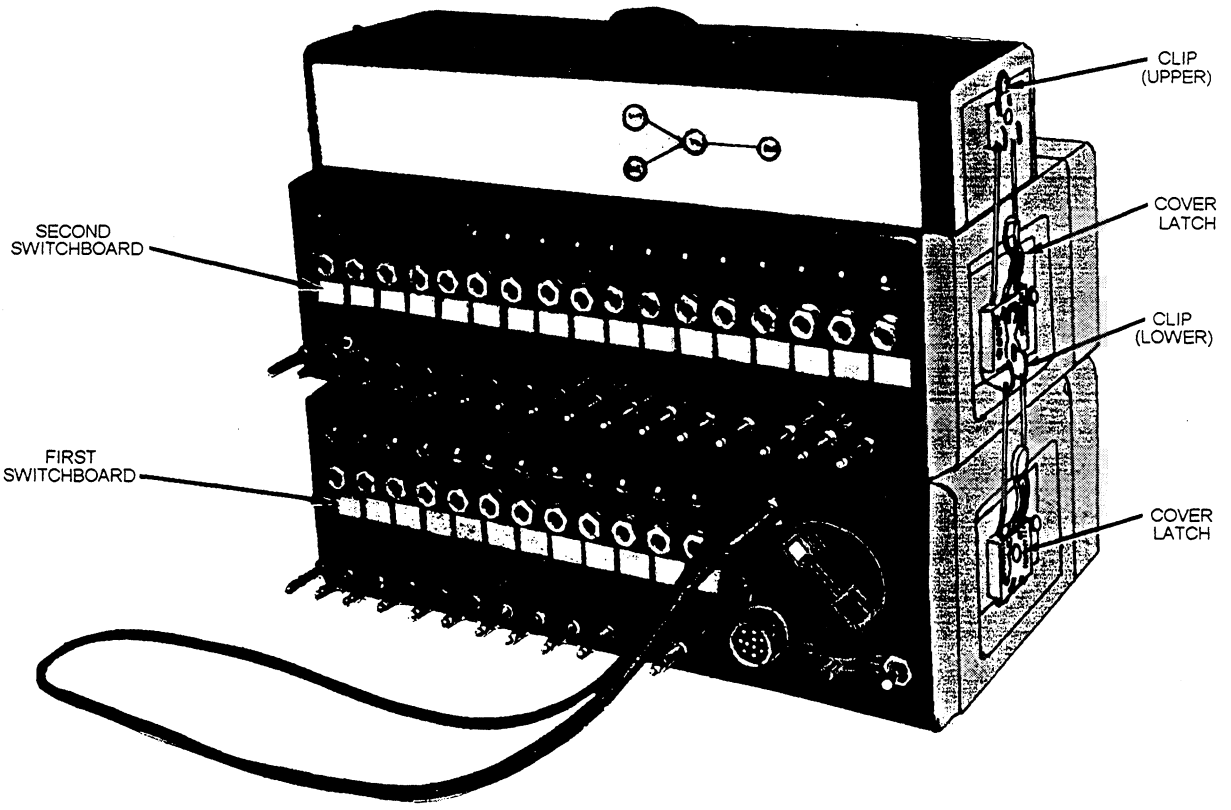


Figure 11-26.—Installation arrangement for two switchboards.

you can ring back the calling party (fig. 11-25, view D). You do this by removing the plug of the operator's cord from the operator's jack on the operator's pack and inserting it into the calling party's jack. Operate the RING BACK-PWR RING FWD switch to the RING BACK, turn the hand-ringing generator rapidly approximately 10 turns. Remove the operator's plug from the calling party's jack and insert it into the operator's jack when both parties answer.

If the called party disconnects before the conversation is completed, remove the plug of the operator's cord from the operator's pack and insert it into the jack of the calling party's line jack Operate the hand-ringing generator rapidly about 10 turns. Remove the plug of the operator's cord from the jack of the calling party's line jack and insert it into the operator's jack on the operator's pack after both parties have answered.

If you must leave the switchboard, move the visual and audible alarm switch (fig. 11-1 8) from VIS to AUD. The alarm is silent on VIS, but audible on AUD. When the alarm is not required, place the VIS/AUD switch in the OFF position.

To operate your switchboard in the dark, pull out on the lamp cap and turn the lamp on. Remember, though, when the lamp is lighting the switchboard, the night alarm cannot be used at the same time.

STACKING OF TWO SWITCHBOARDS

To serve more than 12 but fewer than 30 lines, stack the 12-line switchboards. Remove the operator's pack from the switchboard and install five line packs in the empty space. Place this modified switchboard on top of a normally equipped switchboard. Use two jumpers to connect the two switchboards. One jumper must be connected to the NA binding posts of both switchboards, and the other jumper must be connected to the GND binding posts of both switchboards. Be sure that the jumpers pass through the slot at the side of each switchboard. Only one set of batteries is required to serve both switchboard; remove the battery case from the one containing the 17 line packs (from which the operator's pack has been removed). The field telephones can then be connected. A maximum of 29 lines can be served with this arrangement as shown in figure 11-26.

RADIO AND TELEPHONE PROCEDURES

Even though your primary duties are those of a rifleman, machine gunner, or mortarman, you may be called upon to pick up a radio to pass some valuable information to one of the platoons or to the battalion headquarters.

The intent of this section is to provide enough knowledge of correct radio and telephone procedures so you can operate the voice radio equipment in a Seabee battalion.

The following terms are defined to give you a better understanding of the explanations in the following section:

1. TRANSMISSION: A communication sent by one station and intended for reception by another station or stations.

2. ANSWER: A transmission made by a station called in response to the call received.

3. CALL SIGN: A call sign is a word, or a combination of words, intended for transmission by voice means, and it identifies the command, unit, or authority of the radio station.

4. NET CALL SIGN: The collective call sign that represents all the radio stations operating together on a particular radio net.

5. NET CONTROL STATION: A radio station appointed by higher authority to direct and control the operation and flow of all traffic handled on the radio net.

6. PROWORD: A pronounceable word or phrase that has been assigned a meaning to speed up message handling on radio nets that use radio and telephone. A list of prowords and their meanings is presented later in this section.

7. ABBREVIATED PLAINDRESS MESSAGE: A message that has certain elements of the message heading omitted for speed of handling. Anyone or all of the following may be omitted: precedence, date, date-time group, and group count.

8. RECEIPT: A communication sent by the receiving operator indicating that the message or other transmission has been satisfactorily received.

9. ACKNOWLEDGMENT: A separate message originated by the addressee to inform the originator that his message has been received and is understood.

PHONETIC ALPHABET AND NUMERALS

When necessary to identify a letter of the alphabet, the standard phonetic alphabet should be used. This helps to prevent the receiving operator from copying your words or groups of words incorrectly. Bs, Ps, Ts, and other letters that sound alike can be confusing when heard on radio telephone nets. Learn the phonetic alphabet listed below and the proper pronunciation as spoken over radio nets.

Letter	Phonetic Equivalent	Pronounced
A	ALFA	AL fah
B	BRAVO	BRAH voh
C	CHARLIE	CHAR lee or SHAR lee
D	DELTA	DELL tah
E	ECHO	ECK oh
F	FOXTROT	FOKS trot
G	GOLF	GOLF
H	HOTEL	hoh TELL
I	INDIA	IN dee ah
J	JULIETT	JEW lee ett
K	KILO	KEY loh
L	LIMA	LEE mah
M	MIKE	MIKE
N	NOVEMBER	no VEM ber
O	OSCAR	OSS cah
P	PMA	pah PAH
Q	QUEBEC	keh BECK
R	ROMEO	ROW me oh
S	SIERRA	see AIR rah
T	TANGO	TANG go
U	UNIFORM	YOU nee form
V	VICTOR	VIK tah
W	WHISKEY	WISS key
X	XRAY	ECKS ray
Y	YANKEE	YANG key
Z	ZULU	ZOO loo

USE OF THE PROWORD "I SPELL." Difficult words or groups within the text of the message maybe spelled out using the phonetic alphabet and should be started with the proword "I SPELL."

EXAMPLE: CATENARY . . . . . "I SPELL" CHARLIE, AMA, TANGO, ECHO, NOVEMBER, ALFA, ROMEO, YANKEE. . . CATENARY Where the text is composed of easily pronounced words, they can be spoken.

USE OF PROWORD "FIGURES." In order to distinguish numerals from words similarly pronounced, you may use the proword "FIGURES" before numbers.

TRANSMITTING NUMERALS. When numerals are transmitted by radiotelephone, the rules for their proper pronunciation are as follows:

Numeral	Spoken as
0	ZE RO
1	Wun
2	Too
3	Thuh-ree
4	Fo-wer
5	Fi-yiv
6	Six
7	SEV en
8	Ate
9	NIN er

TRANSMITTING NUMBERS. Numbers are transmitted digit by digit except that exact multiples of hundreds and thousands may be spoken as such; however, there are special cases when the normal pronunciation of numerals is as follows:

Number	Spoken as
44	Fo-wer fo-wer
90	Niner zero
136	Wun thuh-ree siz
500	Fi-yiv hun-dred
1478	Wun fo-wer seven ate
7000	Seven thow-zand
16000	Wun six thow-zand
16400	Wun six fo-wer hun-dred
812681	Ate wun two six ate wun

PROWORDS

The following prowords and their meanings, authorized for general use, are those that are commonly used on the Seabee battalion radio nets.

ALL AFTER: The portion of the message to which I have reference is all of the message which follows .

ALL BEFORE: The portion of the message to which I have reference is all of the message which precedes .

BREAK: I hereby indicate the separation of the text from other portions of the message.

CORRECTION: An error has been made in this transmission. I will continue with the last word I transmitted correctly.

DISREGARD THIS TRANSMISSION: The transmission is an error. Disregard it. This proword shall not be used to cancel a message that has been completely transmitted and for which receipt or acknowledgement has been received.

DO NOT ANSWER: Stations called are not to answer this radio call, receipt for this message, or otherwise transmit in connection with this transmission. When this proword is used, the transmission shall be ended with the proword OUT.

EXEMPT: The addressee call signs immediately following are exempted from the collective call or net call.

FIGURES: Numerals or numbers to follow.

FROM: The originator of this message is indicated by the call sign immediately following.

INFO: The addressee(s) immediately following is/are addressed for information.

I SAY AGAIN: I am repeating transmission or portion indicated.

I SPELL: I shall spell the next word phonetically.

MESSAGE FOLLOWS: A message that requires recording is about to follow. Transmitted immediately after the radio call. (This proword is intended for use when messages are passed on tactical or reporting nets. It is not used on nets intended primarily for conveying messages.)

NUMBER: Station serial number of messages sent. Normally run in sequence for one 24-hour period.

OUT: This is the end of my transmission to you and no answer is required or expected.

OVER: This is the end of my transmission to you and a response is necessary. Go ahead; transmit.

PRECEDENCE PROWORDS: Four precedence designations are used in handling radio messages. These precedence prowords indicate the order in which one message is handled relative to other messages. The originator of the message assigns the precedence of the message. The precedence prowords in order of their importance are as follows:

1. FLASH
2. OPERATIONAL IMMEDIATE
3. PRIORITY
4. ROUTINE

READ BACK: Repeat this entire transmission back to me exactly as you received it.

RELAY Transmit this message to each of the addressees immediately following.

ROGER: I have received your last transmission satisfactorily.

SAY AGAIN: Repeat all of your last transmission. When followed by identification data means "Repeat portion indicated."

THIS IS: This transmission is from the station whose call sign immediately follows.

TO: The addressee(s) immediately following is/are to take action on this message.

WAIT: I must pause for a few seconds.

WAIT OUT: I must pause longer than a few seconds.

WILCO: I have received your message, understand it, and will comply. To be used only by the addressee. Since the meaning of ROGER is included in that of WILCO, the two prowords are never used together.

WORD AFTER: The word of the message to which I have reference is that which follows .

WORD BEFORE: The word of the message to which I have reference is that which precedes .

WORDS TWICE: Communication is difficult. Transmit each phrase (or each code group) twice. This proword may be used as an order, request, or as information.

WRONG: Your last transmission was incorrect. The correct version is .

FIELD MESSAGE FORMAT AND PREPARATION

The field message book, NAVMC 694, is primarily and extensively used in a tactical environment. Each book contains a hundred message forms that are self-carboning for easy duplication. A sample message and instructions for preparing field messages are depicted in figure 11-27. Spaces are provided at the bottom of the form to record the time of receipt (TOR) and time of delivery (TOD). The form is also a convenient reference when records are necessary.

TACTICAL MESSAGE FORMATS

The different types of reports and their content are published in the battalion's operations order (OPORD). On a patrol or in an emergency, you cannot always readily refer to the OPORD. Providing inadequate information, or even worse no information, about tactical situations can be harmful and can prevent a proper response. Always depict who, what, when, where, and how, if known; then, follow it up later as more information becomes available. The rule of thumb for reporting tactical information is to remember the following acronym SALUTE.

Size of enemy unit

Activity of enemy unit

Location of enemy unit(s)

Uniform worn by the enemy

Time of each activity noted

Equipment used or carried by the enemy

SECURITY

An important rule of communication is to remember that the enemy is always listening; therefore, we must always use correct security procedures when communicating classified information. Even seemingly unimportant unclassified information can be a valuable source of intelligence to the enemy. So certain information is prohibited from being transmitted in the clear. This type of information is known as Essential Elements of Friendly Information (EEFI).

The EEFI system is actually a code that allows us to notify one another of a security breach that has occurred over a circuit. The term used to identify a violation of this type is *BEADWINDOW* (example: BEADWINDOW THREE). This indicates to the

PROTECTOR INSERT
Place this under the last copy of each message written.

SAMPLE MESSAGE

Z O P R	DTG (COMM. USE) 080855 W Aug 88	FM: 3D MAR
TO: 3/3		
BT	TOPSEC SECRET CONF UNCLAS	

CONTINUE ATTACK AT 0930. REPORT WHEN OBJECTIVE IS CONSOLIDATED.

BT

RELEASING OFFICER'S SIGNATURE G. D. Barrett	TOR/TOD 3/3/4425 HHZ 8D/0951 W	PAGE 1 of 1

INSTRUCTIONS FOR PREPARING FIELD MESSAGES

1. **DRAFTER:**
   a. Place the protector insert under the message blanks to limit the number of copies produced. Retain one copy in the book as a file copy. Classify cover in accordance with contents.
   b. Use BLOCK CAPITAL letters for all entries.
   c. To assign precedence, circle the appropriate letter using the table on front cover as a guide.
   d. Print organization originating message in "FM" space. (DO NOT USE CALL SIGN.)
   e. Print organization(s) for whom the message is intended in the "TO" space. (DO NOT USE CALL SIGNS.)
   f. To assign classification, circle the appropriate classification printed on the message blank.
   g. DO NOT USE ABBREVIATIONS IN TEXT. (Abbreviations lengthen transmit time.) Be brief. Use simple words. Use "Ø" for all zeros. Number pages in appropriate space.
   h. Drafter is responsible for all message drafting functions to include the use of brevity codes and numeral/letter encryption.
2. **RELEASING OFFICER:**
   a. Ensure drafter functions are completed.
   b. Sign appropriate space if message is approved. (First page only.)
3. **OPERATOR:**
   a. Assign local-time date-time-group, "DTG", if required by unit SOP.
   b. Convert "FM" and "TO" entries to call signs. (FOR UNSECURE VOICE TRANSMISSIONS ONLY.)
   c. Fill in TOR/TOD information, as appropriate:

TOR: TIME/OPERATOR INITIAL/FREQUENCY

TOD: STATION CALLED / OPERATOR INITIAL | FREQUENCY / TIME

Figure 11-27.—Sample message and instructions.

transmitting station that he has violated security. The only response to a BEADWINDOW is ROGER OUT. All violations must be reported. BEADWINDOW procedures are incorporated into the OPORD. They are given below. Others can be added at the discretion of the commander.

BEADWINDOW CODES:

Position - 01	Friendly or enemy position, movement or intended movement: position, course, speed, altitude, or destination of 'any air, sea, or ground element unit or force.
Capabilities - 02	Friendly or enemy capabilities or limitations: force composition or identity, capabilities, limitations or significant casualties to special equipment, weapon systems, sensors, units, or personnel. Percentages of fuel or ammunition remaining.
Operations - 03	Friendly or enemy operations, intentions, progress or results: operational or logistic intentions, assault objectives, mission participants, flying programs, mission situation reports, results of friendly or enemy operations.
Electronic Warfare - 04	Friendly or enemy electronic warfare emission control (EW/EMCON) intentions, progress, or results: intention to employ electronic countermeasures (ECM), results of friendly or enemy electronic counter-countermeasures (ECCM), results of electronic warfare support measures (ESM), present or intended EMCON policy, and equipment affected by EMCON policy.
Personnel - 05	Friendly or enemy key personnel: movement or identity of friendly or enemy flag officers, distinguished visitors, unit commanders, and movements of key maintenance personnel indicating equipment limitations.
COMSEC - 06	Friendly or enemy communications security (COMSEC) locations: linkage of codes or code words with plain language, compromise of changing frequencies or linkage with line numbers, circuit designator linkage of changing call signs with previous call signs or units, compromise of encrypted or classified call signs, and incorrect authentication procedure.
Wrong Circuit - 07	Inappropriate transmission: information requested, transmitted or about to be transmitted that should not be passed on the circuit because it either requires greater security protection or is not appropriate to the purpose for which the circuit is provided.

MESSENGERS

Messenger service is the backbone of the rifle company communication system and is a backup for both the wire and radio systems. Wire lines maybe cut by enemy fire or by enemy infiltration. Radio communication is insecure and should not be relied upon as the only means of communication; therefore, the foot runner is most dependable. The manner in which messengers are used depends on the tactical situation. Normally, a messenger from each rifle platoon is sent to the company command post. Then, with each displacement, he is replaced with a new messenger. This provides the company commander with a runner who knows the exact location of his parent rifle platoon. One company messenger is located in the battalion command

post and is replaced by another upon each company displacement.

Communication by Messenger

When time permits, a message should be written; however, oral messages are often necessary. A complete message must answer the questions of what, when, and where; but a message should be made as brief as possible, omitting words that do not add to the meaning.

A written message should be printed in plain block letters; individual letters contained in the message should be spelled out using the phonetic alphabet (as, Zulu for letter Z). The name of the command authorizing the message and the name of the command to which it is being sent must be written in the message. The actual writer of the message must sign his name and rank or rate.

Messenger Training

A combat messenger must be trained carefully in the following skills:

1. How to deliver messages, either oral or written.

2. How to travel over various kinds of terrain at prescribed speeds.

3. How to use a compass for orientation and direction.

4. How to read maps.

5. How to select routes that provide the best cover and concealment.

6. How to recognize units and command posts with which communication is maintained.

Messenger Briefing

Each messenger must receive a briefing with the following information:

1. The name and location of the post, unit, or person to whom the message is to be delivered.

2. The route to be followed.

3. The danger points to be avoided.

4. The speed required.

5. Whether or not an answer is required.

6. Where to report in case the message cannot be delivered.

7. The contents of the message if the situation warrants.

8. Special instructions, if any.

For an oral message, the messenger must be required to repeat the message to the sender, to memorize it, and to deliver it word-for-word.

COMBAT SIGNALS

Oral (that is, voice) communication is often difficult or impossible under combat conditions. At times, complete silence must be maintained. Under such conditions, signals are used to transmit commands or information. Three types of combat signals are used:

1. Whistle signals

2. Special signals

3. Arm and hand signals

Understanding combat signals is important for a fire team. Make sure you become thoroughly familiar with each signal described in this section. Bear in mind, too, that practice in the use of combat signals is essential if the signals are to be used effectively.

Whistle Signals

As a rule, only three whistle signals are used, since a large variety could cause confusion. The following three are commonly used whistle signals:

1. ATTENTION TO ORDERS is indicated by one short blast on the whistle. It is used to fix the attention of unit members on the unit leader who gives the signal and means that other signals, orders, or commands are to follow.

2. CEASE FIRING is indicated by one long blast on the whistle. This signal is verified immediately by an arm and hand signal or by some other means.

3. HOSTILE AIRCRAFT or MECHANIZED VEHICLE is indicated by three long blasts repeated several times.

Special Signals

Special signals cover all the special methods and devices used to transmit commands or information. Rifle shots or automatic rifle bursts maybe used when the entire command knows their meanings and the sound

1. DECREASE SPEED
EXTEND THE ARM HORIZONTALLY SIDEWARD, PALM TO THE FRONT, AND WAVE ARM DOWNWARD SEVERAL TIMES, KEEPING THE ARM STRAIGHT. ARM DOES NOT MOVE ABOVE THE HORIZONTAL.

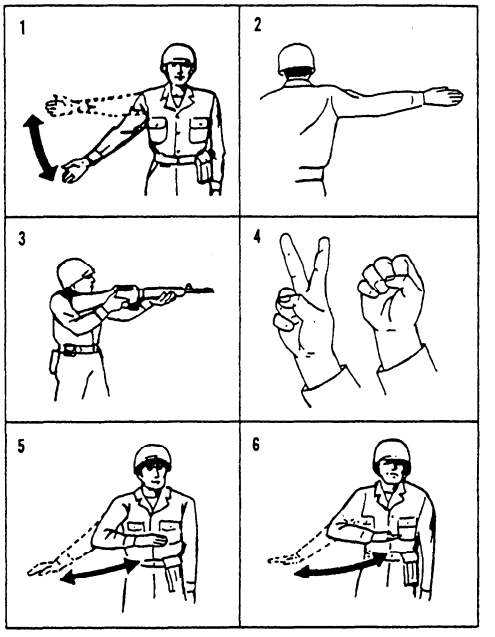
2. CHANGE DIRECTION; OR COLUMN (RIGHT OR LEFT)
EXTEND ARM HORIZONTALLY TO THE SIDE, PALM TO THE FRONT.

3. ENEMY IN SIGHT
HOLD THE RIFLE HORIZONTALLY, WITH THE STOCK IN THE SHOULDER, THE MUZZLE POINTING IN THE DIRECTION OF THE ENEMY.

4. RANGE
EXTEND THE ARM FULLY TOWARD THE LEADER OR MEN FOR WHOM THE SIGNAL IS INTENDED WITH FIST CLOSED. OPEN THE FIST EXPOSING ONE FINGER FOR EACH 100 YARDS OF RANGE.

5. COMMENCE FIRING
EXTEND THE ARM IN FRONT OF THE BODY, HIP HIGH, PALM DOWN, AND MOVE IT THROUGH A WIDE HORIZONTAL ARC SEVERAL TIMES.

6. FIRE FASTER
EXECUTE RAPIDLY THE SIGNAL "COMMENCE FIRING." FOR MACHINEGUNS, A CHANGE TO THE NEXT HIGHER RATE OF FIRE IS PRESCRIBED.



7. FIRE SLOWER
EXECUTE SLOWLY THE SIGNAL "COMMENCE FIRING." FOR MACHINEGUNS, A CHANGE TO THE NEXT LOWER RATE OF FIRE IS REQUIRED.

8. CEASE FIRING
RAISE THE HAND IN FRONT OF THE FOREHEAD, PALM TO THE FRONT, AND SWING THE HAND AND FOREARM UP AND DOWN SEVERAL TIMES IN FRONT OF THE FACE.

9. ASSEMBLE
RAISE THE HAND VERTICALLY TO THE FULL EXTENT OF THE ARM, FINGERS EXTENDED AND JOINED, PALM TO THE FRONT, AND WAVE IN LARGE HORIZONTAL CIRCLES WITH THE ARM AND HAND.

10. FORM COLUMN
RAISE EITHER ARM TO THE VERTICAL POSITION. DROP THE ARM TO THE REAR, DESCRIBING COMPLETE CIRCLES IN A VERTICAL PLANE PARALLEL TO THE BODY. THE SIGNAL MAY BE USED TO INDICATE EITHER A TROOP OR VEHICULAR COLUMN.

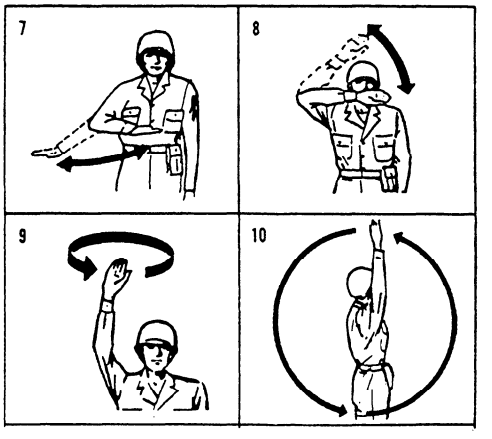


Figure 11-28.—Combat arm and hand signals.

is distinct enough to be heard easily. A squad leader operating at night may find the use of raps on his helmet or rifle effective. Signals must be determined and practiced before they are used. Various pyrotechnic and smoke signals may be chosen as signals to attack, withdraw, mark front lines, or indicate targets.

Certain special signals are standard for all branches of the armed forces to indicate the approach or presence of hostile aircraft or mechanized vehicles. They are as follows:

1. Three long blasts of a whistle, vehicular horn, siren, or Klaxon repeated several times.

2. Three equally spaced shots with rifle or pistol.

3. Three short bursts of fire from automatic small arms.

In daylight, an individual giving the signal should point toward the danger; at night, the alarm should be supplemented by voice warning to indicate the direction–for example, ENEMY TANKS APPROACHING BY THE NORTH ROAD or HOSTILE AIRCRAFT APPROACHING FROM THE WEST.

Unit leaders should devise special signals whenever they appear to be useful in a particular situation. Before devising a special signal for the unit, the leaders should make certain that higher authority has not assigned some other meaning to the same signal.

Combat Arm and Hand Signals

Signals are used to transmit commands or information when voice communication is difficult or impossible or when silence must be maintained. Leaders

11. ARE YOU READY?
EXTEND THE ARM TOWARD THE LEADER FOR WHOM THE SIGNAL IS INTENDED, HAND RAISED, FINGERS EXTENDED AND JOINED, THEN RAISE ARM SLIGHTLY ABOVE HORIZONTAL, PALM FACING OUTWARD.

12. I AM READY
EXECUTE THE SIGNAL ARE YOU READY.

13. SHIFT
RAISE THE HAND THAT IS ON THE SIDE TOWARD THE NEW DIRECTION ACROSS THE BODY, PALM TO THE FRONT; THEN SWING THE ARM IN A HORIZONTAL ARC, EXTENDING ARM AND HAND TO POINT IN THE NEW DIRECTION.

14. ECHELON RIGHT (LEFT)
FACE THE UNIT(S) BEING SIGNALED AND EXTEND ONE ARM 45° ABOVE AND THE OTHER ARM 45° BELOW THE HORIZONTAL, PALMS TO THE FRONT. THE LOWER ARM INDICATES THE DIRECTION OF ECHELON. SUPPLEMENTARY COMMANDS MAY BE GIVEN TO ENSURE PROMPT AND PROPER EXECUTION.

15. AS SKIRMISHERS (FIRE TEAM); LINE FORMATION (SQUAD)
RAISE BOTH ARMS LATERALLY UNTIL HORIZONTAL, ARMS AND HANDS EXTENDED, PALMS DOWN. IF IT IS NECESSARY TO INDICATE A DIRECTION, MOVE IN THE DESIRED DIRECTION AT THE SAME TIME.

16. WEDGE
EXTEND BOTH ARMS DOWNWARD AND TO THE SIDE AT AN ANGLE OF 45° BELOW THE HORIZONTAL, PALMS TO THE FRONT.

17. VEE
EXTEND ARMS AT AN ANGLE OF 45° ABOVE THE HORIZONTAL FORMING THE LETTER "V" WITH ARMS AND TORSO.

18. FIRE TEAM
THE RIGHT ARM SHOULD BE PLACED DIAGONALLY ACROSS THE CHEST.

19. SQUAD
EXTEND THE HAND AND ARM TOWARD THE SQUAD LEADER, PALM OF THE HAND DOWN; DISTINCTLY MOVE THE HAND UP AND DOWN SEVERAL TIMES FROM THE WRIST, HOLDING THE ARM STEADY.

20. PLATOON
EXTEND BOTH ARMS FORWARD, PALMS OF THE HANDS DOWN, TOWARD THE LEADER(S) OR UNIT(S) FOR WHOM THE SIGNAL IS INTENDED AND DESCRIBE LARGE VERTICAL CIRCLES WITH HANDS.

21. CLOSE UP
START SIGNAL WITH BOTH ARMS EXTENDED SIDEWARD, PALMS FORWARD, AND BRING PALMS TOGETHER IN FRONT OF THE BODY MOMENTARILY. WHEN REPETITION OF THIS SIGNAL IS NECESSARY, THE ARMS ARE RETURNED TO THE STARTING POSITION BY MOVEMENT ALONG THE FRONT OF THE BODY.

22. OPEN UP; EXTEND
START SIGNAL WITH ARMS EXTENDED IN FRONT OF THE BODY, PALMS TOGETHER, AND BRING ARMS TO THE HORIZONTAL POSITION AT THE SIDES, PALMS FORWARD. WHEN REPETITION OF THIS SIGNAL IS NECESSARY, THE ARMS ARE RETURNED ALONG THE FRONT OF THE BODY TO THE STARTING POSITION AND THE SIGNAL IS REPEATED UNTIL UNDERSTOOD.

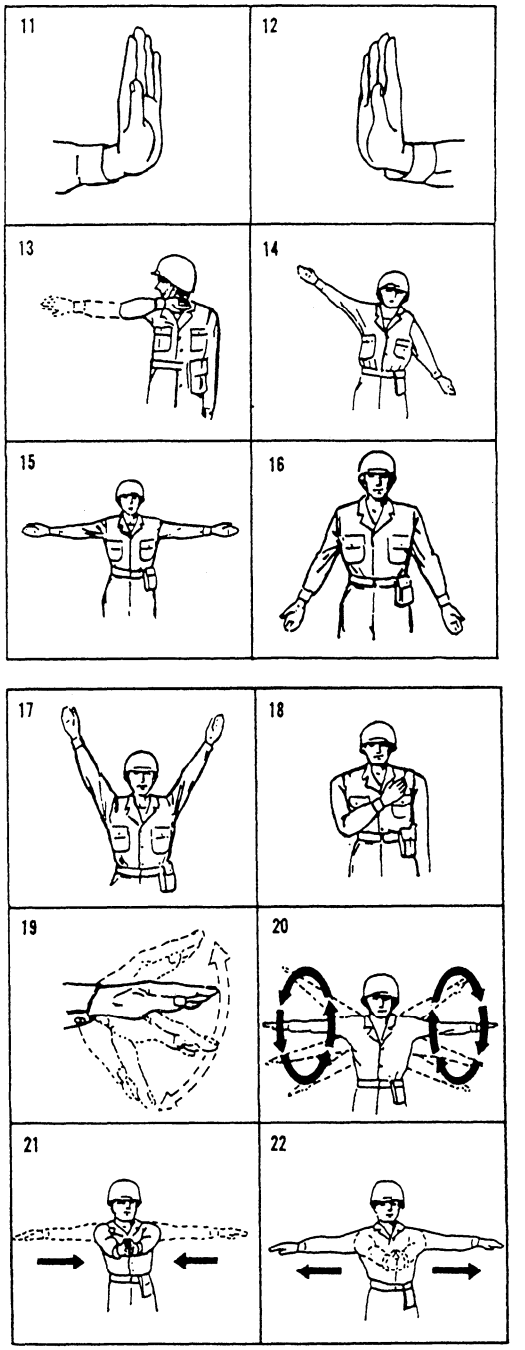


Figure 11-28.—Combat arm and hand signals–Continued.

should repeat signals to their units whenever necessary to ensure prompt and correct execution of orders. Leaders giving arm and hand signals should remember that these are an order of command. The signal is given smartly. Leaders must be aware of their location to ensure the signal can be seen by the intended unit. When a movement is to be executed by particular unit(s), a signal appointing the unit(s) precedes the signal for the actual movement. If a movement is to be executed in unison, the signal for the movement should be followed by the signal READY. After the READY signal is acknowledged, the movement is executed at the same time that the arm is lowered. Signals requiring a change of direction have no connection with the direction in which the person giving the signal is facing. The direction of movement is shown by the direction in which the arm of the signaler points. Standard arm and hand signals are explained in figure 11-28.

23. DISPERSE
EXTEND EITHER ARM VERTICALLY OVERHEAD; WAVE THE HAND AND ARM TO THE FRONT, LEFT, RIGHT, AND REAR, THE PALM TOWARD THE DIRECTION OF EACH MOVEMENT.

24. I DO NOT UNDERSTAND
FACE TOWARD SOURCE OF SIGNAL; RAISE BOTH ARMS SIDEWARDS TO THE HORIZONTAL AT HIP LEVEL, BEND BOTH ARMS AT ELBOWS, PALMS UP, AND SHRUG SHOULDERS IN THE MANNER OF THE UNIVERSAL "I DUNNO."

25. FORWARD; ADVANCE; TO THE RIGHT (LEFT); TO THE REAR (USED WHEN STARTING FROM A HALT).
FACE AND MOVE IN THE DESIRED DIRECTION OF MARCH; AT THE SAME TIME EXTEND THE ARM HORIZONTALLY TO THE REAR; THEN SWING IT OVERHEAD AND FORWARD IN THE DIRECTION OF MOVEMENT UNTIL IT IS HORIZONTAL, PALM DOWN.

26. HALT
CARRY THE HAND TO THE SHOULDER, PALM TO THE FRONT; THEN THRUST THE HAND UPWARD VERTICALLY TO THE FULL EXTENT OF THE ARM AND HOLD IT IN THAT POSITION UNTIL THE SIGNAL IS UNDERSTOOD.

27. FREEZE
MAKE THE SIGNAL FOR "HALT" AND MAKE A FIST WITH THE HAND.

28. DOWN; TAKE COVER
EXTEND ARM SIDEWARD AT AN ANGLE OF 45° ABOVE HORIZONTAL, PALM DOWN, AND LOWER IT TO SIDE. BOTH ARMS MAY BE USED IN GIVING THIS SIGNAL. REPEAT UNTIL UNDERSTOOD.

29. INCREASE SPEED; DOUBLE TIME
CARRY THE HAND TO THE SHOULDER, FIST CLOSED; RAPIDLY THRUST THE FIST UPWARD VERTICALLY TO THE FULL EXTENT OF THE ARM AND BACK TO THE SHOULDER SEVERAL TIMES. THIS SIGNAL IS ALSO USED TO INCREASE GAIT OR SPEED.

30. HASTY AMBUSH RIGHT (LEFT)
RAISE FIST TO SHOULDER LEVEL AND THRUST IT SEVERAL TIMES IN THE DESIRED DIRECTION.

31. RALLY POINT
TOUCH THE BELT BUCKLE WITH ONE HAND AND THEN POINT TO THE GROUND.

32. OBJECTIVE RALLY POINT
TOUCH THE BELT BUCKLE WITH ONE HAND, POINT TO THE GROUND, AND MAKE A CIRCULAR MOTION WITH THE HAND.

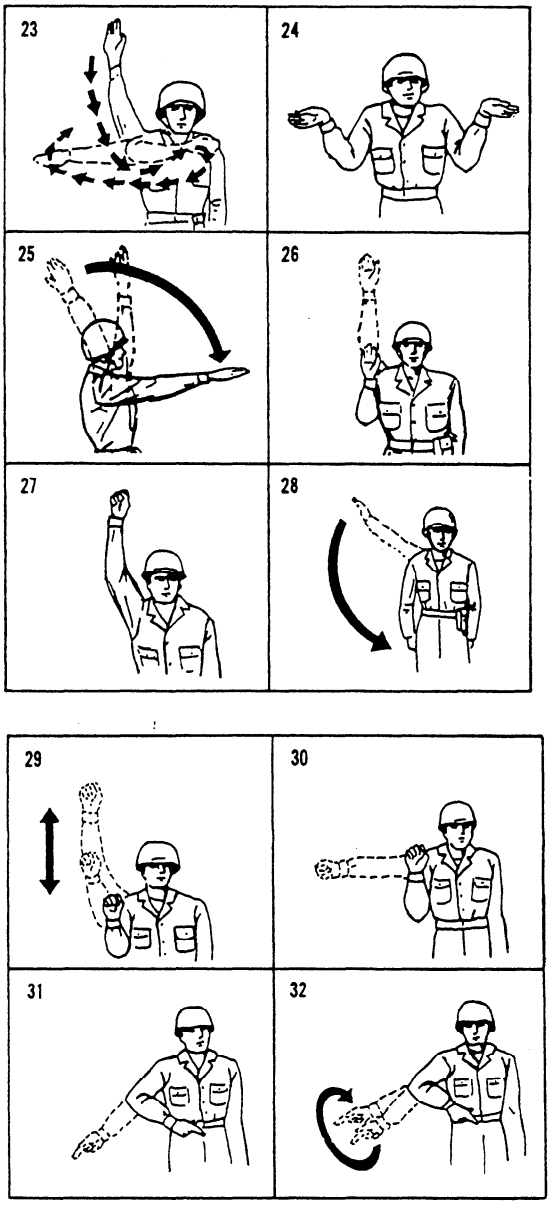


Figure 11-28.—Combat arm and hand signal–Continued.

In modern warfare, a helicopter is a common sight during combat. All personnel should be familiar with hand signals that assist helicopter pilots in landing. Hand signals for guiding a pilot are as follows:

1. To Direct Helicopter Forward. Extend your arms and hands above your head with your palms facing away from the helicopter. Move your hands in a manner that simulates a pulling motion. (See fig. 11-29.)

2. To Direct Helicopter Backward. Extend your arms and hands above your head with your palms facing toward the helicopter. Move your hands in a manner that simulates a pushing motion. (See fig. 11-30.)

3. To Direct Helicopter Sideways. Extend your arms and palms out to your side with your palms facing the direction that the helicopter should move. Move your hands in a manner that simulates pushing the helicopter in the desired direction. (See fig. 11-31.)

4. To Direct Helicopter to Land. Bend your arms at the elbows with your lower arms held parallel to the ground at waist level. Keep palms facing downward parallel to the ground, and forearms moving to simulate a downward pushing motion. (See fig. 11-32.)

5. To Direct Helicopter to Take Off. Extend both hands above your head with fists clenched and thumbs raised. (See fig. 11-33.)

6. To Direct Helicopter to Hold Its Present Position. Cross your forearms above your head with both fists clenched. (See fig. 11-34.)

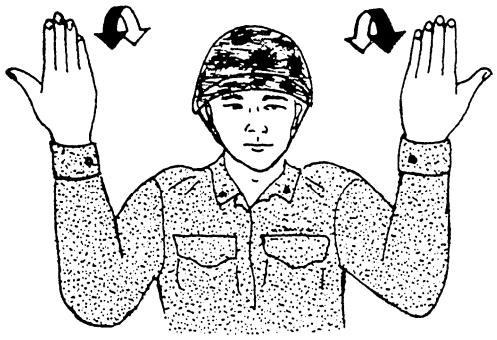


Figure 11-29.—To direct helicopter forward.

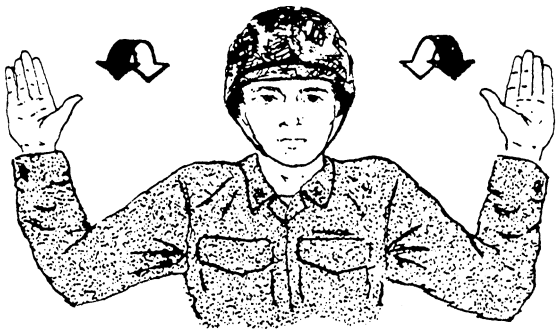


Figure 11-30.—To direct helicopter backward.

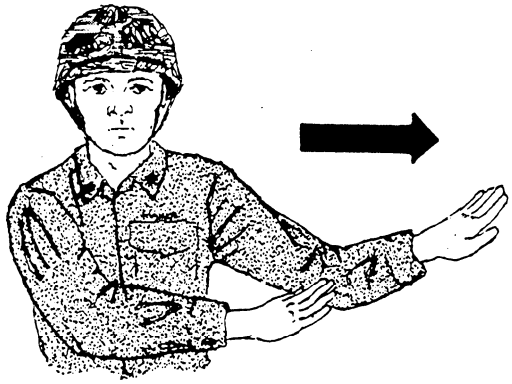


Figure 11-31.—To direct helicopter sideways.

WRITTEN ORDERS

An NMCB's standard operating procedures (SOPs) are a set of written orders issued by the battalion commander. They cover the battalion administrative and tactical operations that lend themselves to a definite or a standardized procedure without loss of effectiveness. The uses of SOPs are as follows:

- To simplify the preparation and transmission of orders;
- To simplify and perfect training of the troops;
- To facilitate operations;
- To minimize confusion and errors; and

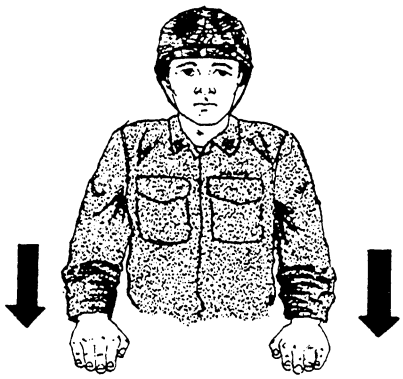


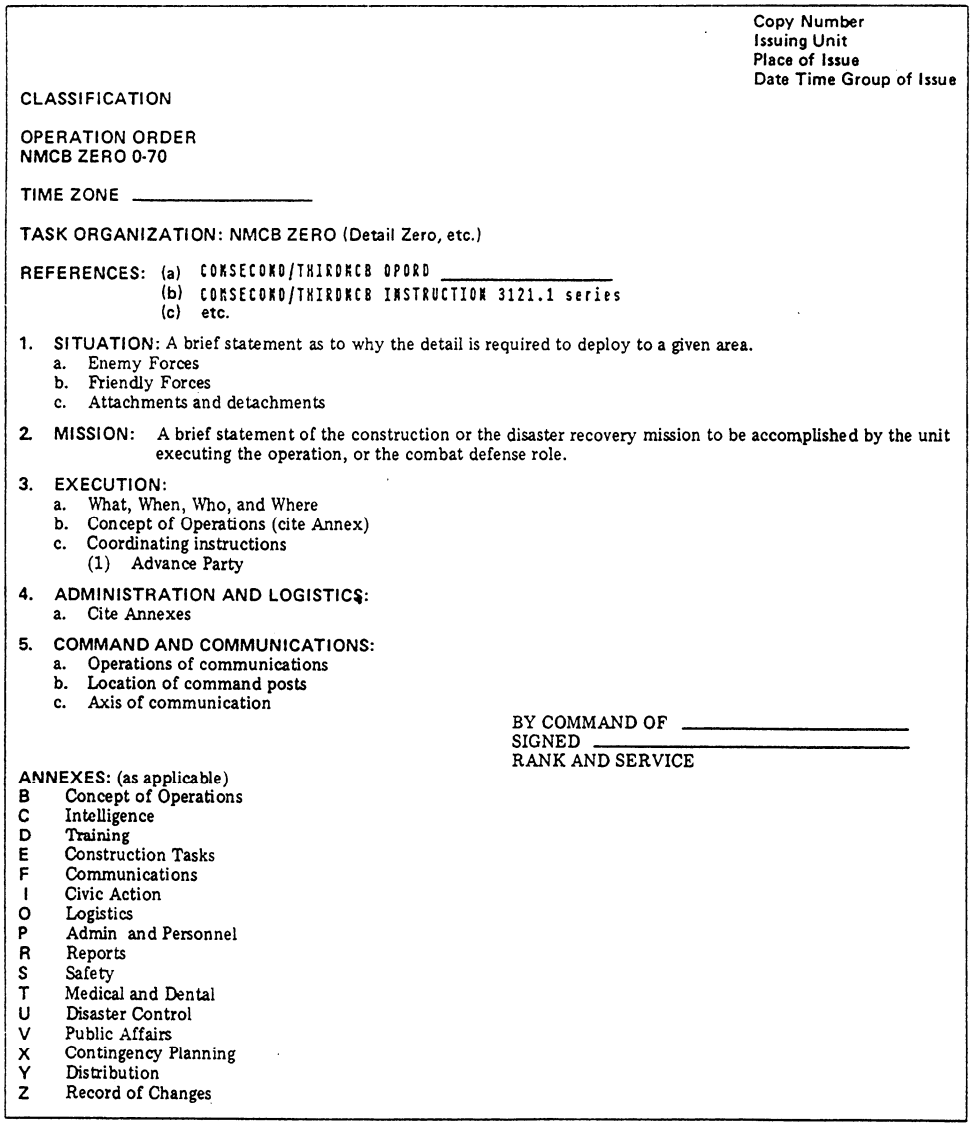
Figure 11-32.—To direct helicopter to land.

Figure 11-33.—To direct helicopter to take off.

Figure 11-34.—To direct helicopter to hold its present position.

- To promote understanding and teamwork between the battalion commander and his subordinates.

Written orders are prepared to cover battalion operations and are available to all personnel for guidance in the absence of other instructions or orders. The details contained in SOPs depend on the desires of the commander and the direction of the higher



Copy Number
Issuing Unit
Place of Issue
Date Time Group of Issue

CLASSIFICATION

OPERATION ORDER
NMCB ZERO 0-70

TIME ZONE _____

TASK ORGANIZATION: NMCB ZERO (Detail Zero, etc.)

REFERENCES: (a) CONSECONO/THIRDNCB OPORD _____
(b) CONSECONO/THIRDNCB INSTRUCTION 3121.1 series
(c) etc.

1. SITUATION: A brief statement as to why the detail is required to deploy to a given area.
   a. Enemy Forces
   b. Friendly Forces
   c. Attachments and detachments
2. MISSION: A brief statement of the construction or the disaster recovery mission to be accomplished by the unit executing the operation, or the combat defense role.
3. EXECUTION:
   a. What, When, Who, and Where
   b. Concept of Operations (cite Annex)
   c. Coordinating instructions
      (1) Advance Party
4. ADMINISTRATION AND LOGISTICS:
   a. Cite Annexes
5. COMMAND AND COMMUNICATIONS:
   a. Operations of communications
   b. Location of command posts
   c. Axis of communication

BY COMMAND OF _____
SIGNED _____
RANK AND SERVICE

ANNEXES: (as applicable)
B Concept of Operations
C Intelligence
D Training
E Construction Tasks
F Communications
I Civic Action
O Logistics
P Admin and Personnel
R Reports
S Safety
T Medical and Dental
U Disaster Control
V Public Affairs
X Contingency Planning
Y Distribution
Z Record of Changes

Figure 11-35.—Standard format for an operation order.

command; however, SOPs must contain all the information needed to serve as a guide for new personnel assigned to the battalion.

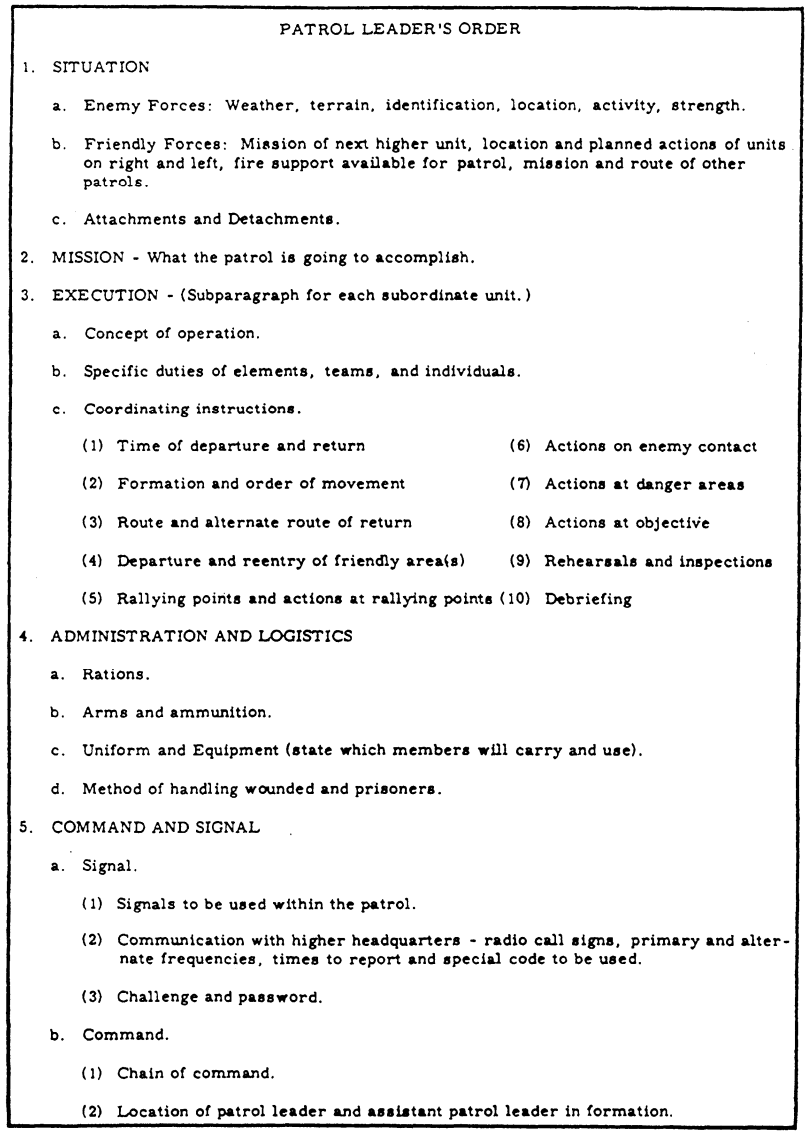
Operation Orders (OPORD)

An OPERATION PLAN (OPLAN) is a detailed statement l of a course of action to be followed to accomplish a future mission. An OPERATION ORDER (OPORD) (See fig. 11-35.) puts an OPLAN into effect. The OPORD is a formal statement issued by the senior commander to subordinate commanders that outlines the coordinated execution of a future operation in the field.

In five paragraphs, OPLANs and OPORDs detail the complete information and orders necessary to carry out the decision of the commander. They are written so subordinate units and agencies can have a thorough understanding of the part each is to play in the operations.

OPORDs maybe oral, dictated, or in written form. The most important determining factor of the form and method of issuing an OPORD is the time available for its preparation and distribution. An order should reach its destination in enough time to avoid halting troops while they wait for further instructions. Even the lowest subordinate commander needs time to reconnoiter, place his troops in position, make other necessary arrangements, and issue his own orders before the hour set for beginning the action.

Oral and dictated orders are similar because both are spoken orders. When oral orders are issued, notes are made by the persons receiving them. Dictated orders are recorded verbatim by the receiver. A complete copy of



PATROL LEADER'S ORDER

1. SITUATION
   a. Enemy Forces: Weather, terrain, identification, location, activity, strength.
   b. Friendly Forces: Mission of next higher unit, location and planned actions of units on right and left, fire support available for patrol, mission and route of other patrols.
   c. Attachments and Detachments.
2. MISSION - What the patrol is going to accomplish.
3. EXECUTION - (Subparagraph for each subordinate unit.)
   a. Concept of operation.
   b. Specific duties of elements, teams, and individuals.
   c. Coordinating instructions.
      (1) Time of departure and return
      (2) Formation and order of movement
      (3) Route and alternate route of return
      (4) Departure and reentry of friendly area(s)
      (5) Rallying points and actions at rallying points
      (6) Actions on enemy contact
      (7) Actions at danger areas
      (8) Actions at objective
      (9) Rehearsals and inspections
      (10) Debriefing
4. ADMINISTRATION AND LOGISTICS
   a. Rations.
   b. Arms and ammunition.
   c. Uniform and Equipment (state which members will carry and use).
   d. Method of handling wounded and prisoners.
5. COMMAND AND SIGNAL
   a. Signal.
      (1) Signals to be used within the patrol.
      (2) Communication with higher headquarters - radio call signs, primary and alternate frequencies, times to report and special code to be used.
      (3) Challenge and password.
   b. Command.
      (1) Chain of command.
      (2) Location of patrol leader and assistant patrol leader in formation.

Figure 11-36—Format for patrol leader's order.

the order or notes is kept by the staff of the issuing commander.

Written orders may be in a message or other convenient form. The use of accompanying maps, photomaps, overlays, and tables saves time and words and minimizes errors. In many cases, an entire OPORD can be placed on a map or overlay.

Format for OPORD

The HEADING contains the security classification, a statement about changes from oral orders, copy number (handwritten), issuing headquarters, the place of issue, date and time of issue, file notation, title and serial number of the order, references (maps, charts, and photomaps), and the time zone to be used throughout the order. When a code name for the operation is used, it is written on the same line as the OPORD title and number.

The BODY contains the task organization (when too complicated or lengthy to be contained in paragraph 3) and the five main numbered paragraphs. The five paragraphs cover the following topics in the order listed: (1) SITUATION, (2) MISSION, (3) EXECUTION, (4) ADMINISTRATION AND LOGISTICS, and (5) COMMAND AND COMMUNICATIONS. The acronym SMEAC (using the frost letter of each topic) helps you remember these topics. Remember that the five main topics of an operation order must be covered whether the order is from a battalion commander, platoon commander, squad leader, or fire team leader. Naturally, battalion operation orders are quite lengthy, and a patrol leader's order is usually brief. The format of a patrol leader's order is shown in figure 11-36. The

orders of a patrol leader are usually given orally. Each patrol member should take accurate notes.

The task organization of an operation order includes the task subdivisions or tactical components that make up the command together with the names and grades of the commanders. (See fig. 11-35 again.) Support units are shown under the headquarters of the major unit that commands them–not under the headquarters of the unit they support. Attached units are shown under the headquarters of the unit to which they are attached. Units should be listed under paragraph letters that correspond to those in paragraph 3. Only the task subdivisions in the echelon of command just below the issuing unit are normally shown.

Paragraph 1. SITUATION always has three subparagraphs: Enemy Forces, Friendly Forces, and Attachments and Detachments. This paragraph contains information only. It does not include plans or instructions.

Paragraph 1.a. Enemy Forces contains information about the enemy that affects the operation, such as their locations, dispositions, strength, activities, and capabilities.

Paragraph 1.b. Friendly Forces contains a statement of the mission of the next higher unit; the location and planned actions of the unit on the right and left; the fire support available for the patrol; and the mission and route of other patrols.

Paragraph 1.c. Attachments and Detachments contains a list of nonorganic units attached to, and organic units detached from, the command for the specific operation. It includes the date/time the attachment or detachment is to take place.

Paragraph 2. MISSION contains a concise statement of the mission, its purpose, and of the command as a whole. It includes "what," "how," "where," and as much of "why" as maybe proper. There are no subparagraphs.

Paragraph 3. EXECUTION assigns definite tasks to each element of the command, organic and attached, that contributes to carrying out the overall mission. No restrictions are set on the number of subparagraphs.

Paragraphs 3.a. Concept of Operations is a clear, concise summary of how the commander visualizes the operation should be conducted. This is an enlargement of the decision contained in the commander's estimate. This paragraph should be as brief as possible; but it may be published as an annex or shown on an operation overlay when it is lengthy or detailed. When an overlay is used, it need not be written. When an overlay or annex is used, this paragraph makes reference to it.

Paragraphs 3.b., 3.c., and so forth (tasks for subordinate units) are assigned separate subparagraphs lettered in alphabetical sequence to each major subordinate element. These subparagraphs correspond to the alphabetical listings in the task organization. Except as outlined below, all instructions to any unit having a tactical mission should appear in the subparagraph of paragraph 3 about that unit. Subparagraphs that assign tasks to other combat and combat support elements (if applicable) should follow.

The final subparagraph of paragraph 3, always entitled Coordinating Instructions, contains the details of coordination and the control measures that apply to the command as a whole; for example, objectives, comments, qualifying time of attack line of departure, boundaries, beaches, bombline, and reference to march table annex. Many of these and other instructions that apply to two or more elements of the command maybe indicated in an attached overlay. In this case, they need not be repeated here. In this paragraph essential elements of information might be included (unless an intelligence annex is issued). Examples are operational reports to be submitted, if not set forth elsewhere by written order, preparatory fire information, and the effective time of the order.

Paragraph 4. ADMINISTRATION AND LOGISTICS contains administrative and logistic instructions, when an administrative order is not issued. When an order is issued, this paragraph refers to that order. In a small command, such as a Naval Mobile Construction Battalion, this paragraph contains all the necessary information and instructions about supply, evacuation, hospitalization, transportation, service, personnel, and similar matters.

Paragraph 5. COMMAND AND SIGNAL contains instructions about the command, command relationships, and the operations of communications and electronics.

Paragraph 5.a. Signal may refer to a standard plan or to a communications annex if one has been issued. When a communications annex has not been issued, paragraph 5a should contain references to the index of communications instructions (COI) currently in effect, instructions on the use of radio and pyrotechnics, and restrictions on the use of any means of communication.

Paragraph 5.b. Command gives the location of the command post of the issuing unit and those of subordinate units, when they are known. When the

location of the command post or subordinate units is unknown, instructions about the reporting of command posts when opened maybe included.

Paragraph 5.c. This subparagraph shows the axis of communications (indicated by successive tentative command post locations) and the location and time of opening of the message centers.

Also, subparagraphs may be included about recognition and identification instructions, electronic policy, code words, liaison, and command relationships. Most items in paragraph 5 can usually be shown graphically on the operation map or overlay. When this is done, they need not be repeated in writing.

The ENDING of an operation order contains the signature, a list of annexes (if any), the distribution, the authentication (except on the original), and the classification.

Annexes to Operation Orders

Annexes to OPORDs include those used for purposes of brevity, clarity, and simplicity (for example, maps and overlays). Annexes may also be used to amplify an order when the volume is too great to be included in the order itself.

Annexes are issued to all units whose actions or movements are affected by the information and instructions they contain.

Written annexes usually follow the form required for the complete OPORD except that information and instructions already given in the order need not be repeated in the annex. Annexes are lettered alphabetically in the order they are used in the OPORD.

Maps of the following types are frequently used as annexes: situation maps, operation maps, administrative maps, and circulation maps.

Annexes dealing with embarkation, debarkation, entraining, entrucking, march tables, and other technical data are shown in tabular form.

Prepare and submit the annexes to the commander for approval and signature before issue. Another staff officer verifies the annexes.

Preparing OPORDs

Orders must be clear, concise, and direct. Those giving missions to a subordinate unit should prescribe only the details or methods of execution needed to ensure that the actions of that specific subordinate unit conforms to the plan of operations for the force as a whole.

Paragraphs 1 and 2 of an OPORD are usually written in present tense. For simplicity and clarity, the affirmative form of expression is used throughout the order.

When the date and hour are undetermined, D-day and H-hour may be substituted; when the final date and hour are selected, they are communicated later to those concerned.

When the hour is given, it is expressed in the 24-hour-clock system with no punctuation between the hours and minutes. When orders apply to units in different time zones, Greenwich mean time or the time zone specified by higher headquarters should be used. The zone suffix letter immediately follows the last digit of the group; for example, time expressed as 060225Z March 94, indicates 6 March 1994 at 2:25 a.m. Greenwich mean time.

An OPORD that specifies a night should include both dates; for example, “night 4-5 Aug 94.”

Boundaries are assigned that limit zones of action or movement and areas of responsibility. These are designated by easily distinguishable terrain features in the sequence in which they occur on the ground. This sequence is normally given in the direction of the enemy, but in the case of retrograde movement, in the reverse direction.

Geographical names are written or printed in capital letters. This minimizes the chance of error and makes the places mentioned stand out prominently in the order. The spelling in the order must be the same as that on the map referred to in the heading of the order.

Compass points are preferable to the terms *right* and left. Should right or left be necessary, the user is assumed to be facing the enemy or downstream when used with reference to a river.

When places or features are difficult to find on the map or when confusion may arise with names of similar spelling, they should be identified by coordinates or by stating locations in relation to some easily recognizable feature or place on the map.

Roads are identified by name or by a sequence of points on the road; they are named in the direction of movement. When there is no movement from right to left or rear to front, it is assumed that the person naming the road is facing the enemy. All other lines are designated in the same manner.

Areas are indicated by names, counterclockwise with a suitable number of limiting points. The first point named, regardless of whether the area pertains to friendly troops or to the enemy, is one on the right front facing friendly troops.

Expressions like "attack vigorously" are avoided. They are not only meaningless and wordy, but also weaken the force of later orders in which the expression does not appear. "Holding attack" "secondary attack/' and "main attack," which qualify the vigor of the operation, and "try and hold" and "far as possible," which lessen responsibility, are further examples of undesirable phrases for use in OPORDs.

In operation orders, it is essential that there be no opportunity for misunderstanding by any subordinate of the exact intended meaning of each term used. When you are leading partially trained troops and staffs, remember that the use of technical military language may cause misunderstandings; therefore, the use of technical expressions in combat orders should be avoided when there is any danger of misunderstanding by personnel in the unit. You should substitute words that are easy to understand even at the expense of brevity. Clarity is the first essential; technique is secondary.

COUNTERSIGNS

The commanding officer directs the use of the countersign. Sentries of an interior guard may use the countersign, but countersigns are primarily for use by sentries or persons defending tactical areas.

By Whom Authorized

When a countersign is prescribed, the highest headquarters within a zone or area devises it. The authority to designate a countersign may be delegated to subordinate units for their immediate use when necessary; however, these units must notify higher headquarters of such action without delay. Only one countersign can be used within a command during a specified period.

Selecting the Countersign

The choice of words or sounds for the countersign is made with care. When possible, words are selected that are difficult for the enemy to pronounce. The word selected for the secret challenge, or countersign must not suggest the word selected for the password. Doing this minimizes the possibility of an unauthorized person guessing the password. (For example, the secret challenge, ATOMIC, suggests the password BOMB.)

Using the Countersign

The initiative for use of the countersign rests with the challenging sentry. Positive recognition of each person claiming authority to pass is the main consideration of the sentry. When he does not visually recognize the challenged person or party, he uses the countersign to make a positive recognition. When there is any doubt as to the authority of the challenged person to pass, even if he gives the correct password, he is detained for further action by the corporal of the guard. When the sentry recognizes the challenged person or party before using the countersign and there is no doubt the person or party has authority to pass, the sentry does not use the countersign.

Mutual identification is essential. If the person challenged does not recognize the secret countersign, he should not give the password.

When a secret challenge and password are prescribed, the secret challenge is given by the sentry after the person is advanced to be recognized. The person challenged should then give the password. Both the secret challenge and the password are given in a low tone to prevent them from being heard by others.

For example, a sentry observes a person approaching his post during the time for challenging. When the person is still far enough away from the sentry's post for the sentry to take effective measures should the person rush him after being challenged, he commands, "HALT! WHO IS THERE?" After receiving an answer (such as, "Lieutenant Jones, Company B") indicating the person is friendly and may be authorized to pass, the sentry says, "Advance, Lieutenant Jones to be recognized." When Lieutenant Jones reaches a point where the secret challenge, spoken in a low tone, can be heard only by him, the sentry again commands, "HALT!" then he gives the secret challenge or countersign, in a low tone (for example, "SNOWFLAKE"). After receiving the correct password from Lieutenant Jones (for example, "ROOSTER") and otherwise satisfying himself that the Lieutenant is authorized to pass, the sentry says, "Advance, Lieutenant Jones" and salutes, if appropriate. If Lieutenant Jones is one of a party challenged and is the person advanced according to the procedures discussed here, the sentry then tells Lieutenant Jones to bring up his men and identify each individual before he passes.